full one-shot videos on :**JK Coding Pathshala YouTube channel**

JK Coding Pathshala

https://youtube.com/@jayeshkande9215?feature=shared

Mapping of Course Outcomes for Unit II	**CO2**	
Unit III	**COMMON STANDARDS AND CLOUD PLATFORMS**	**(06 hrs)**

Common Standards: The Open Cloud Consortium, Open Virtualization Format, Standards for Applicatior
Developers: Browsers (Ajax), Data (XML, JSON), Solution Stacks (LAMP and LAPP), Syndication (Atom, Atom Publishing Protocol, and RSS), Standards for Security.

Amazon web services: Compute services Storage Services Communication Services Additional services
Google AppEngine: Architecture and core concepts, Application life cycle, Cost model

Microsoft Azure: Azure core concepts, SQL Azure, Windows Azure platform appliance

Common Standards: The Open Cloud Consortium, Open Virtualization Format, Standards for Application

a) What are the common standards supported by open cloud Consortium. **[8]**

a) What are the different standards for application developers on cloud platform? **[8]**

Common Standards

Common Standards ka matlab kya hai?
"Common Standards" ka matlab hai aise rules ya guidelines jo sab log follow karte hain — taaki sab systems easily ek dusre se kaam kar sakein.

Jaise agar sab log same charger use karein, toh phone charging easy ho jaata hai. Waise hi, cloud computing mein agar sab same standards follow karein, toh data share karna, apps chalana aur security maintain karna easy ho jaata hai.

OCC kya hai? (What is OCC?)

OCC = Open Cloud Consortium

Ye ek **non-profit group** hai jo universities, companies, aur government organizations ko cloud computing aur big data research ke liye **help karta hai**.

Iska main goal hai:
•Cloud technology ko develop karna
•Data share karna
•Research support karna
•Common standards banana taaki sab systems milke kaam karein

Simple Example:

Socho 3 log alag-alag jagah se ek hi file pe kaam karna chahte hain. Agar unke paas ek **shared Google Drive** jaisa platform ho toh sab ek jagah se access kar sakte hain.

OCC bhi aise hi shared cloud space aur tools provide karta hai research aur science ke liye.

📏 Common Standards supported by OCC

1. 🌐 Interoperability Standards
•Systems easily ek dusre se baat kar saken
•Jaise: **Different cloud providers (AWS, Google Cloud, etc.) ko ek system jaise use karna**

✅ Real-Life Example:

Aapka mobile Apple ka hai, aur friend ka Android. Dono ke phones agar same charger use kar saken (USB-C), toh ye **common standard** ka benefit hai.

Cloud mein bhi, OCC aise hi standard APIs and formats banata hai taaki alag-alag systems easily connn.ect ho sake

2. 🎁 Open Virtualization Format (OVF)
•Virtual machines ko package karne ka ek format
•Kisi bhi system pe deploy karne mein easy

✅ Real-Life Example:

Jaise aap ek game zip file mein download karte ho aur kisi bhi computer pe extract karke chala sakte ho — waise hi OVF ek **virtual machine ka zip format** hota hai, jise aap cloud pe easily use kar sakte ho.

3. Scientific Data Standards

•Scientific research ke liye large data formats jaise:

- HDF5
- NetCDF
- FAIR data principles (Findable, Accessible, Interoperable, Reusable)

✅ Real-Life Example:

Jaise doctors ke paas patients ka data hota hai, aur wo agar common format mein ho (PDF, JSON), toh wo easily usko software mein daal ke analysis kar sakte hain.
Waise hi scientists ke data formats bhi **standard** hone chahiye taaki sharing aur analysis easy ho.

4. 🔐 Security Standards
•Secure login and data protection ke liye

- OAuth
- OpenID
- X.509 Certificates

✅ Real-Life Example:
Jaise aap Facebook se login karte ho kisi app mein, wo secure login hota hai via **OAuth**.
OCC bhi research systems mein aise hi **secure access standards** use karta hai.

5. 🚀 Cloud Application Standards

•APIs, app design, aur deployment standards

- OpenAPI
- TOSCA
- CloudEvents

✅ Real-Life Example:

Jaise agar aap ek food delivery app bana rahe ho, toh aapko APIs use karne padenge (restaurant list, payment gateway).
OpenAPI standard banata hai taaki aapka app har server ya cloud pe chal sake – bina extra coding ke.

🎁 Open Virtualization Format (OVF) – Kya Hai?

OVF ek **standard format** hai jo **virtual machines (VMs)** ko package karne aur share karne ke liye banaya gaya hai.

Simple Words Mein:

Socho aapne ek **software + operating system + settings** ready kiya, aur aap chahte ho ki ye same setup kisi aur ke system mein bhi chale — bina naye se install kare.

Toh aap **OVF format** mein pura VM package bana ke de sakte ho. Fir koi bhi usse apne cloud ya virtualization platform (jaise VMware, VirtualBox, etc.) pe run kar sakta hai.

📌 **Features of OVF – :**

1.✅ **Platform Independent** –
Windows, Linux, ya koi bhi hypervisor (VMware, VirtualBox, KVM) pe chalega.

2.💼 **Single Package** –
Sab kuch ek folder ya file mein hota hai: VM image, configuration, settings.

3.🔐 **Secure & Standardized** –
Industry-approved format, trusted by big cloud providers.

4.🔄 **Easy to Move (Portable)** –
Aap OVF ko ek system se doosre system mein easily copy kar sakte ho.

Real-Life Example:

Situation:
Aap ek **web server** banate ho (Linux + Apache + your website files). Aap chahte ho ki dusra developer exact same setup apne system mein use kare — bina manual install ke.

Solution:
Aap us server ka **Virtual Machine bana ke** usko **OVF format** mein export karte ho.
Phir dusra developer sirf OVF import karega apne VirtualBox/VMware mein — aur same server 5 min mein ready ho jayega.
No installation, no extra setup!

Standards for Application

AJAX

🔢 No.	🔑 Topic	❓ Explanation (HiEnglish)
1️⃣	Full Form	**A**synchronous **J**avaScript **A**nd **X**ML
2️⃣	Use	Web page ko **bina reload** kiye server se data send/receive karna
3️⃣	Real Example	Google search suggestions – type karte hi results aa jaate hain
4️⃣	Works With	JavaScript + JSON/XML + fetch() or XMLHttpRequest
5️⃣	Benefit	Website **fast aur interactive** banti hai – no full page reload

JSON

🔢 No.	🔑 Topic	❓ Explanation (HiEnglish)
1	Full Form	**J**ava**S**cript **O**bject **N**otation
2	Kya Hai?	Data store aur exchange karne ka lightweight format
3	Data Format	Text format jo easily read aur write kiya ja sakta hai
4	Use Case	Web applications mein data send/receive karne ke liye
5	Format Example	{ "name": "Amit", "age": 25, "city": "Delhi" }
6	Advantage	Simple, easy to understand, almost sab programming languages support karta hai

📦 XML

🔢 No.	🔑 Topic	💡 Explanation (HiEnglish)
1️⃣	Full Form	**E**xtensible **M**arkup **L**anguage
2️⃣	Kya Hai?	Ek text-based format jo data ko structure mein store karta hai
3️⃣	Use Case	Data exchange ke liye (web services, config files, etc.)
4️⃣	Format Example	<person><name>Amit</name><age>25</age></person>
5️⃣	Advantage	Human aur machine dono easily samajh sakte hain, flexible structure

Syndication

📌 **Syndication Kya Hai?**
Syndication ka matlab hota hai **content ko multiple websites ya users tak automatically distribute karna** — jaise news, blog posts, ya updates.

•Jab koi website apna content regularly update karti hai, to wo apna **feed** banati hai jise log subscribe kar sakte hain.
•Yeh feed ek special format mein hota hai jise feed readers ya apps samajh kar latest updates show karte hain.

📌 What is **Atom** and **RSS**?

Term	Meaning & Use (HiEnglish)
Atom	Ek web feed format jo websites ke updated content ko share karta hai. Yeh XML-based hota hai aur zyada modern hai.
RSS	Ek purana web feed format jo websites ke latest updates ko users tak pahunchata hai. Yeh bhi XML pe based hai.

VS Difference between **Atom** and **RSS**

Feature	Atom	RSS
Format Version	Latest version, zyada flexible aur powerful	Purana version, simple aur thoda limited
XML Structure	Strict XML format, namespaces use karta hai	Simple XML format, kam namespaces
Date Format	Uses standard date/time format (RFC 3339)	Date format thoda inconsistent ho sakta hai
Extensibility	Easily extendable, new elements add kar sakte hain	Limited extensibility
Content Support	Supports full content, summaries, media easily	Mostly summaries aur simple content support karta hai
Popularity	Naya aur zyada modern use hota hai	Bahut widely used, especially older sites
Use Case	Advanced applications, flexible data needs	Simple news feeds, blogs

⚙️ Working of Atom Feed

Step No.	What Happens (HiEnglish)
1️⃣	Website ya blog apna updated content **Atom XML format** mein banata hai.
2️⃣	Atom feed server pe upload hota hai.
3️⃣	User ka feed reader (app) time-time pe Atom feed check karta hai.
4️⃣	Feed reader naya content (articles, posts) download karta hai.
5️⃣	User ko bina website reload kiye latest updates dikhai dete hain.

⚙️ Working of RSS Feed

Step No.	What Happens
1	Website apna updated content **RSS XML format** mein banata hai.
2	RSS feed server pe upload hota hai.
3	User ka RSS reader (app) regular interval pe RSS feed check karta hai.
4	Feed reader naye articles ko download karta hai.
5	User ko bina page reload kiye recent news ya blog updates milte hain.

Atom Publishing Protocol (APP)

Topic	Explanation (HiEnglish)
Kya Hai?	Ek protocol jo web apps ko allow karta hai remote se content create, update, delete karne ke liye.
Use Case	Blogs, websites, apps jahan users online content post ya edit karte hain.
Kaise Kaam Karta Hai?	Client (app) server ko request bhejta hai, server content Atom format mein save karta hai.
Features	Remote editing, standard format use karta hai, publishing process ko easy banata hai.
Example	WordPress ya Blogger jahan aap mobile se directly blog post bhej sakte hain.
Format	Atom XML format use karta hai content store karne ke liye.

Feature/Aspect	RSS	Atom	Atom Publishing Protocol (APP)
Format	XML	XML (modern & flexible)	Protocol on top of Atom for editing feeds
Use	Simple content sharing	Richer metadata & extensible	Remote content creation/editing
Popularity	Very widely used	Growing adoption	Used for publishing tools & blog editors
Supports Content Editing	No	No	Yes

Solution Stacks

Solution stack ek **set (group)** hota hai software tools aur technologies ka, jo milke ek complete system banate hain, jisse hum web applications ya software bana sakte hain aur chala sakte hain.

LAMP Stack (Popular Web Development Stack)

Component	What It Is	Explanation (HiEnglish)	Example
L	Linux	Operating system (OS) — free and open-source	Ubuntu, CentOS
A	Apache	Web server software that serves websites	Apache HTTP Server
M	MySQL	Database system to store data	MySQL Community Edition
P	PHP	Programming language for building web apps	PHP 7 or PHP 8

🧳 **LAPP Stack** (Similar to LAMP but with PostgreSQL)

Component	What It Is	Explanation (HiEnglish)	Example
L	Linux	Operating system (OS) — free and open-source	Ubuntu, Debian
A	Apache	Web server software that serves websites	Apache HTTP Server
P	PostgreSQL	Database system — powerful, advanced alternative to MySQL	PostgreSQL 13 or 14
P	PHP	Programming language for building web apps	PHP 7 or PHP 8

🔒 Security Standards

Standard	Kya Karta Hai (Asaan Shabdon Mein)	Example
OAuth 2.0	Apps ko safe access deta hai bina password diye	“Login with Google” button
OpenID Connect	Apps ko batata hai aap kaun ho (login karna)	Ek login se kai apps use karna
SSL/TLS	Data ko online safe rakhta hai (encrypt karta hai)	Websites pe https aur lock sign
SAML	Company ke apps ke liye ek login system banata hai	Work ke liye ek hi login
JWT	Safe token bhejta hai jo user verify karta hai	Mobile apps me user check karna
X.509 Certificate	Website ki asli aur safe hone ki guarantee deta hai	Secure websites ka certificate
FIDO2 / WebAuthn	Password ke bina fingerprint ya security key se login	Fingerprint se login karna

a) Explain SAML and OAuth as standards for Security.

2. OAuth (Open Authorization)

•**Kya hai?**

OAuth ek **authorization standard** hai. Iska matlab user kisi app ko apne data ka access de sakta hai **without sharing password**.

•**Kaise kaam karta hai?**

- User kisi app (jaise Instagram) ko allow karta hai ki woh uske Google contacts access kare.
- OAuth ek **access token** deta hai.
- App is token se data access karti hai, lekin user ka password nahi chahiye.

•**Use kahaan hota hai?**

- Mobile apps, web apps jahan third-party data chahiye hota hai.
- Example: Facebook login se kisi dusri app mein entry lena.

1. SAML (Security Assertion Markup Language)

•**Kya hai?**

SAML ek **standard** hai jo user ko **ek baar login** karne ke baad multiple websites par access deta hai (Single Sign-On - SSO).

•**Kaise kaam karta hai?**

- User ek baar login karta hai (jaise Gmail).
- Phir woh token milta hai (XML format mein).
- Yeh token dusre website/app ko batata hai: "Yeh user already verified hai."

•**Use kahaan hota hai?**

- Mostly **enterprises** (badi companies) use karte hain for internal apps.
- Example: Employee login kare aur CRM, Email, HR tools sab access mile.

Difference between on demand instances and spot instance in Amazon cloud. **[4]**

b) Explain steps to launch an EC2 instance in AWS.

Define Bucket in Amazon S3 and differentiate between DynamoDB and Amazon S3. **[6]**

a) Write a short note on **[6]**

i) Amazon Elastic Block Store (EBS)

ii) Amazon ElasticCache

b) Write short note on [6]
   i) Amazon CloudFront
   ii) Amazon S3

c) Explain following Amazon Database Service [6]
   i) Amazon Relational Database Service (RDS)
   ii) Dynamo DB

a) How are Spot Instance, On-demand Instance, and Reserved Instance different from one another in Amazon web services. [6]

Amazon Web Services

Category	Examples (Services)	Use in Simple Words (HiEnglish)
Compute Services	EC2, Lambda, Elastic Beanstalk	Server banane ke liye, ya code run karne ke liye bina server ke
Storage Services	S3, EBS, Glacier, EFS	Data store karne ke liye – like files, backups, ya big data
Communication Services	SNS, SES, SQS	Messages ya notifications bhejne ke liye (SMS, Email, Queues)
Additional Services	CloudWatch, IAM, CloudTrail, Route 53, CloudFront	Monitoring, security, domain setup, and fast content delivery

EC2 (Elastic Compute Cloud) ek AWS service hai jo virtual server (instance) provide karti hai. Isse aap internet pe apna server run kar sakte ho, jaise Windows ya Linux machine.

Step	Action	HiEnglish Explanation
1	Login to AWS	AWS website pe login karo.
2	Launch EC2	EC2 service open karo aur "Launch Instance" dabao.
3	Select OS & Instance Type	OS (Ubuntu, Windows) aur size (t2.micro) choose karo.
4	Set Storage & Security Group	Disk size aur firewall rules set karo.
5	Review & Launch with Key Pair	Sab kuch check karke, key pair select karke launch karo.

Define Bucket in Amazon S3 and differentiate between DynamoDB and Amazon S3. **[6]**

✅ **Define Bucket in Amazon S3**

Bucket ek container hota hai jisme Amazon S3 ke andar aap apne data (files, images, videos) ko store karte ho. Har bucket ka unique naam hota hai, aur usme multiple files (objects) rakhe ja sakte hain.

Feature	**Amazon S3**	**DynamoDB**
Use	File storage (images, videos, backups)	NoSQL database for fast data read/write
Data Type	Stores objects/files	Stores structured data (tables, rows)
Access	URL or API se file access hota hai	Query language (API) se data access hota hai
Best For	Large media and backups	Real-time apps like gaming, chat, IoT
Scalability	Highly scalable for storage	Auto-scalable for database transactions
Example	Store user profile pictures	Store user login data or chat messages

Difference between on demand instances and spot instance in Amazon cloud. [4]

Point	On-Demand Instance	Spot Instance
1. Pricing	Fixed price hota hai, thoda mehenga hota hai	Bohot sasta hota hai, up to 90% discount milta hai
2. Availability	Hamesha available hota hai	Sirf tab available hota hai jab AWS ke paas extra capacity ho
3. Interruption	Kabhi interrupt nahi hota	Kabhi bhi AWS terminate kar sakta hai (2-minute notice ke saath)
4. Use Case	Critical aur short-term workloads ke liye suitable hai	Testing, batch jobs jaise flexible workloads ke liye best hai
5. Control	Full control rehta hai user ke paas	Limited control – AWS decide karta hai kab stop karega
6. Reliability	Zyada reliable hota hai	Kam reliable hota hai due to termination chance

a) Write a short note on [6]

i) Amazon Elastic Block Store (EBS)

ii) Amazon ElasticCache

i) **Amazon Elastic Block Store (EBS)**

Sr. No.	Point	Explanation (Hinglish)
1	Block-Level Storage	EBS block-level storage provide karta hai, jaise hard disk.
2	Persistent Data	EC2 instance stop/restart hone ke baad bhi data safe rehta hai.
3	Snapshot Support	Data ka backup lene ke liye snapshots banaye ja sakte hain.
4	High Performance	High IOPS (Input/Output per Second) support karta hai, ideal for databases.
5	Scalable Volumes	Storage ko dynamically increase kiya ja sakta hai without downtime.
6	Encrypted Volumes	Data ko encryption ke saath securely store karta hai.

ii) **Amazon ElastiCache**

Sr. No.	Point	Explanation (Hinglish)
1	In-Memory Caching	Frequently used data ko RAM mein cache karta hai fast access ke liye.
2	Supports Redis & Memcached	Popular open-source engines jaise Redis aur Memcached support karta hai.
3	Reduces DB Load	Backend database pe load kam karta hai by serving cached queries.
4	Low Latency	Microsecond response times deta hai, best for real-time apps.
5	Scalable	Cluster mode ke saath cache nodes ko horizontally scale kiya ja sakta hai.
6	Fully Managed	AWS automatically updates, patches, and monitors the service.

b) Write short note on [6]
   i) Amazon CloudFront
   ii) Amazon S3

c) Explain following Amazon Database Service [6]
   i) Amazon Relational Database Service (RDS)
   ii) Dynamo DB

i) **Amazon CloudFront**

Sr. No.	Point	Explanation (Hinglish)
1	CDN Service	CloudFront ek Content Delivery Network hai jo content ko globally distribute karta hai.
2	Low Latency	User ke nearest edge location se content deliver karke delay kam karta hai.
3	Secure Delivery	HTTPS support karta hai for secure content transfer.
4	Caching	Frequently accessed data ko cache karta hai performance ke liye.
5	Integration with AWS	Easily integrate hota hai S3, EC2, Lambda ke saath.
6	Real-time Metrics	CloudWatch ke through monitoring aur analytics deta hai.

ii) **Amazon S3 (Simple Storage Service)**

Sr. No.	Point	Explanation (Hinglish)
1	Object Storage	Data ko objects ke form mein store karta hai.
2	Scalability	Exabytes tak data store karne ki capability hai.
3	Durability	99.999999999% durability offer karta hai.
4	Data Retrieval	Anytime, anywhere se data retrieve kiya ja sakta hai.
5	Versioning	File ke old versions ko preserve karta hai.
6	Cost-Effective	Pay-as-you-go model follow karta hai.

c) Amazon Database Services:

i) **Amazon Relational Database Service (RDS)**

Sr. No.	Point	Explanation (Hinglish)
1	Managed Database	AWS automatically database ka maintenance karta hai.
2	Multi-Engine Support	MySQL, PostgreSQL, Oracle, SQL Server, etc. ko support karta hai.
3	Auto Backup	Daily automated backups generate karta hai.
4	High Availability	Multi-AZ deployment ke saath data loss ka risk kam hota hai.
5	Performance Monitoring	CloudWatch ke saath monitoring and alerts deta hai.
6	Easy Scaling	Storage aur compute resources easily scale kiye ja sakte hain.

Point No.	Hinglish Explanation
1	**Serverless NoSQL Database** – AWS manage karta hai, khud server handle karne ki zarurat nahi.
2	**High Speed** – Millisecond latency ke saath real-time apps ke liye perfect hai.
3	**Scalable** – Auto scaling support karta hai, data badhne par performance low nahi hoti.
4	**Flexible Schema** – Table mein rows alag-alag attributes rakh sakte ho (schema-less).
5	**Secure & Reliable** – Encryption, IAM, aur multi-region backup support deta hai.
6	**Easy Integration** – Lambda, API Gateway, aur AWS services ke saath easily connect hota hai.

a) How are Spot Instance, On-demand Instance, and Reserved Instance different from one another in Amazon web services. [6]

Type	Explanation (Hinglish)
1. On-Demand Instance	Jab chaaho tab instance launch karo aur jitna use karo utna hi paise do. No upfront cost, per hour billing. Ideal for short-term aur unpredictable workload.
2. Reserved Instance	Long-term commitment (1 ya 3 saal ke liye) ke saath low cost per hour. Pehle se reserve karna padta hai. Best for stable workload jahan usage predictable ho.
3. Spot Instance	AWS ke unused instances ko kam daam mein milta hai. Bidding system hota hai. Kabhi bhi terminate ho sakta hai. Cost-saving ke liye best, but not reliable.

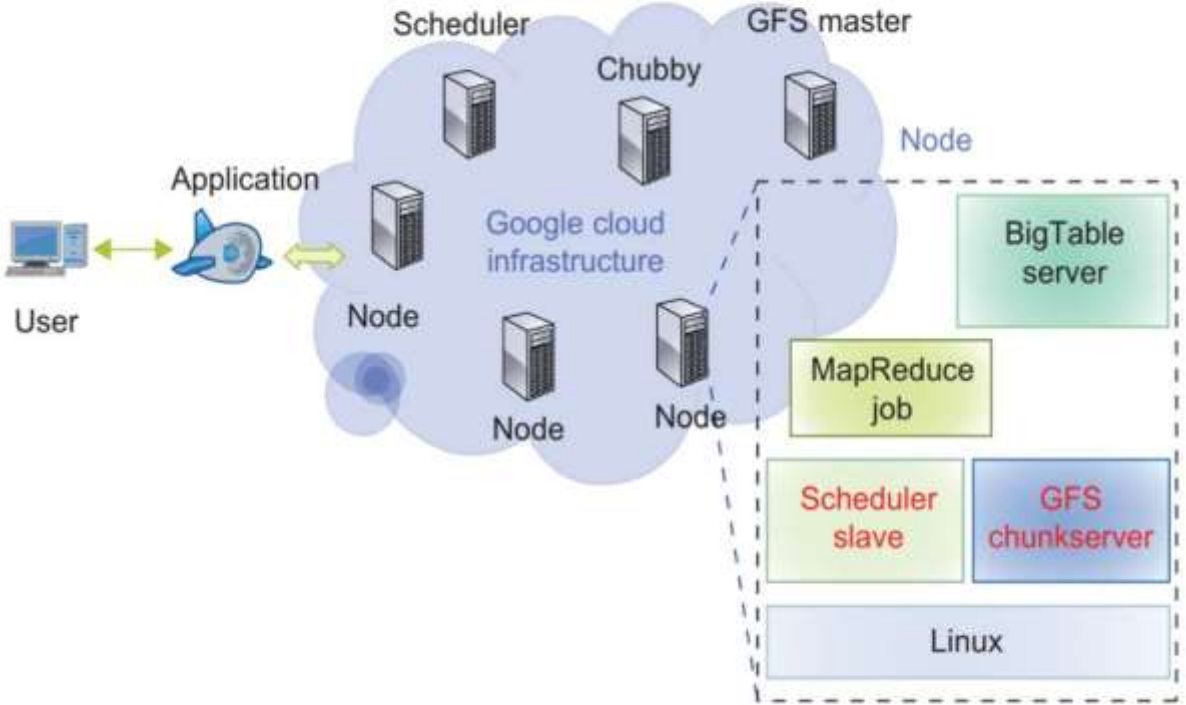
Factor	On-Demand	Reserved	Spot
Cost	High (per hour billing)	Low (long-term commitment)	Very Low (bidding based)
Payment	No upfront	Partial/Full upfront	No upfront
Usage Time	Short-term aur unpredictable workload ke liye best	Long-term stable workload ke liye best	Flexible tasks jaise batch jobs, testing, etc.
Reliability	Highly reliable	Highly reliable	Least reliable (terminate ho sakta hai anytime)
Availability	Always available	Guaranteed capacity	Available only if bid matches and capacity free hoti hai
Use Case	Testing, dev work, urgent task	Web apps, enterprise software, backend services	Data analysis, background jobs, fault-tolerant tasks

Google App Engine:
Architecture and core concepts,
Application life cycle, Cost model

a) Explain the architecture of Google App Engine with neat diagram. [8]

b) Explain the Programming environment of Google App Engine. [6]

Point	Explanation (Hinglish)
1.	**GAE ka full form** – Google App Engine hai.
2.	Ye ek **Platform as a Service (PaaS)** hai jo developers ko web applications banane, run karne aur scale karne ke liye use hota hai bina servers manage kiye.
3.	Aap sirf apna code likhte ho (Java, Python, Node.js, PHP, etc.) aur GAE automatically usko **host aur scale** karta hai.
4.	Isme built-in **load balancing, health checks, auto-scaling, aur version control** jese features hote hain.
5.	GAE automatically application ko multiple servers par **deploy aur distribute** karta hai.
6.	Ye Google Cloud Infrastructure par based hai aur highly reliable aur secure platform provide karta hai.


Scheduler
GFS master
Chubby
Node
Application
Google cloud infrastructure
BigTable server
User
Node
Node
Node
MapReduce job
Scheduler slave
GFS chunkserver
Linux

GAE Architecture Components and Their Roles

Step No.	Component	Role/Explanation (Hinglish)
1	User	User web browser ya mobile app se request bhejta hai.
2	Application	Ye user request ko receive karta hai aur Google Cloud Infra ko forward karta hai.
3	Google Cloud Nodes	Ye servers hote hain jo app ko host karte hain aur requests ko process karte hain.
4	Scheduler	Ye decide karta hai ki kaunsa node kis task ko handle karega (load balancing).
5	Chubby	Ye ek lock service hai jo data consistency aur coordination maintain karta hai.
6	GFS Master	Ye batata hai data kis chunkserver pe store hai (metadata manage karta hai).

Internal Components of a Node

Component Name	Explanation
BigTable Server	High performance NoSQL database jisme large scale data store hota hai.
MapReduce Job	Parallel processing ke liye use hota hai – large data ko divide karke process karta hai.
Scheduler Slave	Ye node-level scheduler hota hai jo master scheduler ke instructions follow karta hai.
GFS Chunkserver	Actual file data ko store karta hai (Google File System ka part hota hai).
Linux OS	Base operating system jisme ye sab components run hote hain – mostly Linux hota hai.

b) Explain the Programming environment of Google App Engine. [6]

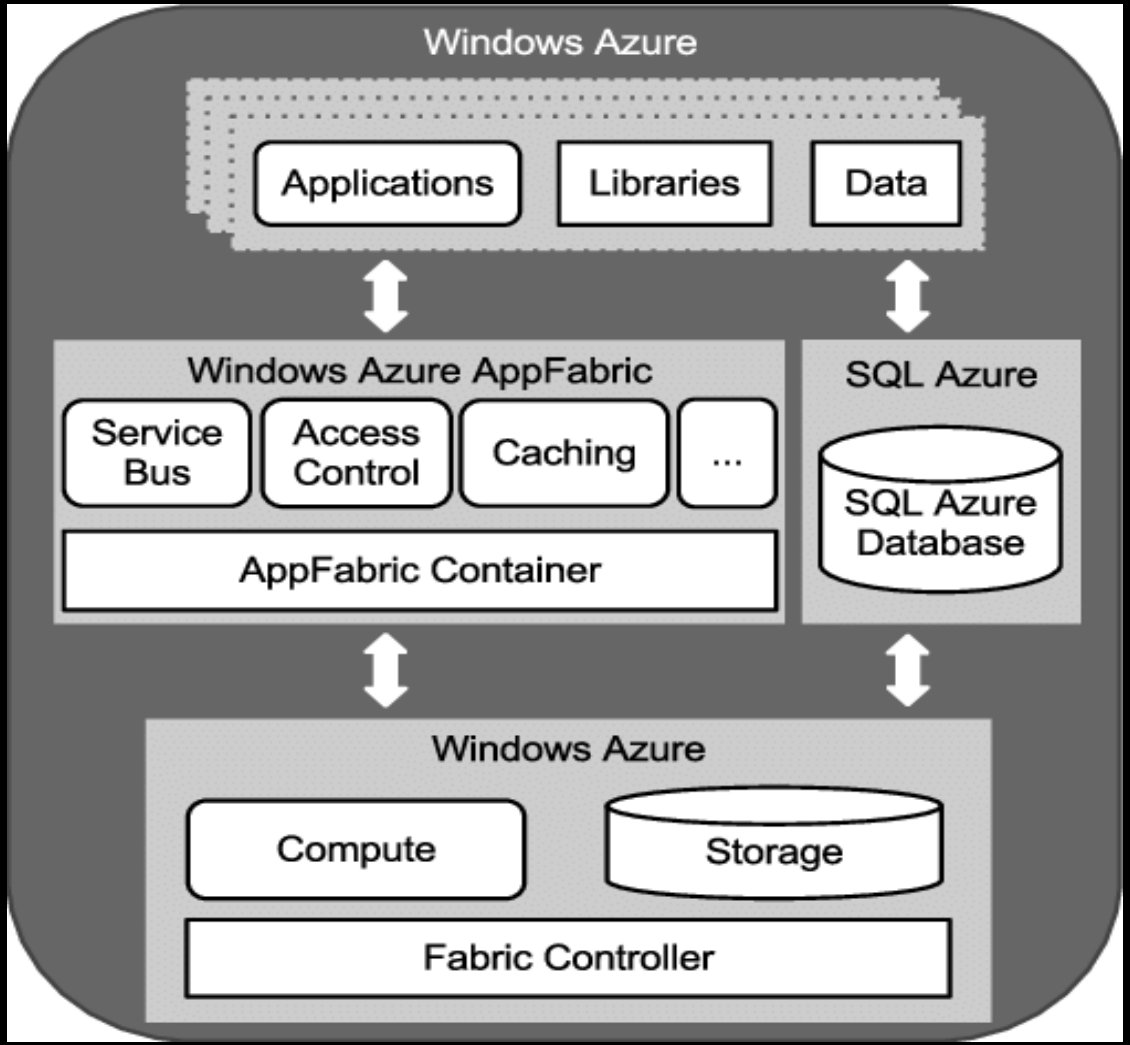
Component	Explanation
1. **Supported Languages**	GAE multiple languages support karta hai jaise: Python, Java, PHP, Node.js, Go, Ruby, etc.
2. **Development Environment**	Developer **local system par SDK** install karta hai jisse application test aur debug ki ja sake deployment ke pehle.
3. **App Engine SDK**	Google ka Software Development Kit (SDK) tools provide karta hai jaise: local server, deployment tool, logging, etc.
4. **app.yaml File**	Configuration file hoti hai jisme runtime, instance settings, handler configuration, etc. define hote hain.
5. **Datastore & Services**	GAE provide karta hai NoSQL **Datastore**, **Cloud SQL**, **Cloud Storage**, aur **Memcache** jese services.
6. **Automatic Scaling**	Application ko **automatic scale** kiya jata hai based on traffic load. Developers ko manual scaling ki zarurat nahi padti.

Microsoft Azure:
Azure core concepts,
SQL Azure,
Windows Azure platform appliance

b) Explain the significance of Azure SQL.

Write short note on Windows Azure Platform architecture.

c) What are the main elements in windows Azure. Explain the significance of each. [6]


Windows Azure
Applications
Libraries
Data
Windows Azure AppFabric
Service Bus
Access Control
Caching
...
AppFabric Container
SQL Azure
SQL Azure Database
Windows Azure
Compute
Storage
Fabric Controller

Layer	Component	Explanation
1. User Layer	Applications	User-deployed apps (web, mobile, APIs) that run on Azure.
	Libraries	Reusable code packages used by applications.
	Data	Data generated or used by applications; stored in cloud databases or storage.
2. Platform Services	**Windows Azure AppFabric**	Middleware services that support cloud apps.
	Service Bus	Messaging system for communication between apps or services.
	Access Control	Manages identity, authentication, and authorization of users.
	Caching	Provides fast, temporary data storage to reduce latency and database load.
	AppFabric Container	Manages the execution and coordination of AppFabric services.
	SQL Azure	Microsoft's cloud-based relational database service (similar to SQL Server).
	SQL Azure Database	Stores structured data; supports scalable and secure data storage with high availability.
3. Infrastructure Layer	Compute	Virtual machines or roles (Web/Worker) to execute application logic.
	Storage	Blob, Queue, Table, and File storage to store all forms of data.
	Fabric Controller	Core manager that handles load balancing, scaling, health monitoring, VM deployment, and service availability.

b) Explain the significance of Azure SQL.

Point	Explanation
1. Cloud-based Service	Azure SQL ek cloud-based database service hai jo Microsoft Azure pe chalti hai.
2. Scalability	Isme aap easily apni storage aur performance ko scale up/down kar sakte ho.
3. High Availability	Built-in high availability milta hai bina kisi extra setup ke.
4. Security	Advanced security features jaise encryption, firewalls, aur threat detection included hai.
5. Maintenance Free	Backups, patching, aur updates Microsoft handle karta hai—user ko kuch karne ki zarurat nahi.
6. Cost Efficient	Pay-as-you-go model hai, jisme sirf jitna use karo utna hi paisa lagta hai.
7. Integration	Easy integration hoti hai Azure ke dusre services jaise Power BI, Azure Functions ke saath.
8. Performance Monitoring	Built-in tools hote hain jo performance ko monitor aur optimize karne mein help karte hain.

c) What are the main elements in windows Azure. Explain the significance of each. [6]

Element	Explanation
1. Compute	Azure Compute aapko VMs (Virtual Machines), App Services aur Functions chalane ki facility deta hai. Ye processing power provide karta hai.
2. Storage	Azure Storage me blobs, tables, queues aur files store kar sakte ho. Ye reliable aur scalable hota hai.
3. Networking	Virtual networks, load balancers, VPN gateways provide karta hai for secure and fast connectivity.
4. Azure SQL/Database	Managed databases jaise SQL Database aur Cosmos DB milti hain, jisse data ko easily manage kar sakte hain.
5. App Services	Web apps aur APIs banane aur host karne ke liye platform provide karta hai, bina infrastructure manage kiye.
6. Azure Active Directory (AAD)	Identity and access management ke liye use hota hai – user login aur permissions handle karta hai.

Q1) a) What are the common standards supported by open cloud Consortium. **[8]**

b) Explain the significance of Azure SQL. **[6]**

c) Difference between on demand instances and spot instance in Amazon cloud. **[4]**

OR

Q2) a) Explain the architecture of Google App Engine with neat diagram. **[8]**

b) Describe various standards for Messaging over cloud platform. **[6]**

c) Explain the significance of Open Cloud Test-bed. **[4]**

b) Describe various standards for Messaging over cloud platform. **[6]**

c) Explain the significance of Open Cloud Test-bed. **[4]**

Standard	Hinglish Explanation
SMTP (Simple Mail Transfer Protocol)	Email bhejne ke liye use hota hai, mainly text-based message communication ke liye.
XMPP (Extensible Messaging and Presence Protocol)	Real-time messaging ke liye use hota hai – instant messaging apps mein common hai.
AMQP (Advanced Message Queuing Protocol)	Secure, reliable aur queue-based messaging ke liye standard protocol hai.
MQTT (Message Queuing Telemetry Transport)	Lightweight protocol hai IoT devices ke liye – low bandwidth aur high latency environments.
RESTful APIs / HTTP	Web-based communication ke liye cloud apps REST APIs use karte hain, messaging ke liye bhi.
WebSockets	Full-duplex communication provide karta hai – real-time chat apps mein use hota hai.

Point	Hinglish Explanation
Research & Development	Cloud applications aur services ka testing environment deta hai – naye tools test kar sakte ho.
Open & Collaborative	Multiple institutions aur researchers ek hi platform pe kaam kar sakte hain.
Performance Testing	Network latency, data transfer rate, etc. jaise metrics ko measure karne mein madad milti hai.
Scalability Check	Cloud systems ki performance ko scale hone par test kiya ja sakta hai.

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🔢 No.	🎯 Purpose of Open Cloud Consortium (OCC)	📝 Explanation
1	Promote open cloud computing standards	Cloud computing ke liye open aur shared standards banana aur promote karna
2	Support scientific and medical research	Research ke liye cloud-based infrastructure provide karna
3	Develop open source cloud software	Open source tools aur platforms develop karna taaki sab use kar sakein
4	Encourage collaboration among institutions	Universities, labs, aur industries ke beech collaboration ko promote karna
5	Manage cloud testbeds and data centers	Large-scale testbeds aur data centers ko manage aur operate karna for experiments

☁️ Microsoft Azure ke Major Uses

🔢 No.	💼 Use Case	📝 Explanation (Hinglish)
1	**Virtual Machines (VMs)**	Cloud mein apna virtual computer banake run kar sakte ho (Linux/Windows)
2	**Web App Hosting**	Websites aur web apps ko easily host aur scale karne ke liye
3	**Database Services**	SQL Server, MySQL, PostgreSQL jaise databases ko cloud mein run karne ke liye
4	**Backup & Disaster Recovery**	Data ka automatic backup aur recovery solutions provide karta hai
5	**Machine Learning & AI**	ML models train karne, deploy karne ke liye ready-made tools milte hain
6	**DevOps & CI/CD Pipelines**	Code build, test, aur deploy karne ke liye Azure DevOps tools use hote hain
7	**IoT Solutions**	IoT devices ka data collect aur process karne ke liye
8	**Big Data & Analytics**	Large data ko store, process aur visualize karne ke liye services deta hai
9	**Hybrid Cloud Integration**	On-premise servers ko Azure ke saath easily integrate kar sakte ho
10	**Security & Identity Management**	Azure AD (Active Directory) se user authentication aur access control hota hai

🔢 No.	Feature	☁️ Cloud	🔢 Grid	🗣️ Hinglish Explanation
1	**Meaning**	Centralized platform for services/data	Network of distributed systems	Cloud ek center system hai, Grid mein computers milke kaam karte hain
2	**Architecture**	Centralized	Decentralized	Cloud mein sab kuch ek jagah control hota hai, Grid alag-alag nodes mein
3	**Resource Sharing**	Based on service (on-demand)	Based on collaboration/sharing	Cloud mein service ke liye pay karte hain, Grid mein resource share hota hai
4	**Scalability**	Highly scalable	Limited scalability	Cloud ko easily scale kiya ja sakta hai, Grid mein mushkil hota hai
5	**Main Use**	Data storage, app hosting, services	Scientific computing, simulations	Cloud = business/apps, Grid = research/heavy calculation
6	**Ownership**	Usually owned by companies	Shared by organizations or communities	Cloud mostly private hota hai, Grid collaborative hota hai

Q1) a) Write short note on following standards of application developer **[6]**

i) LAMP

ii) LAPP

b) Explain steps to launch an EC2 instance in AWS. **[6]**

c) Define Atom and RSS and differentiate between Atom and RSS. **[6]**

OR

Q2) a) Explain SAML and OAuth as standards for Security. **[6]**

b) Define Bucket in Amazon S3 and differentiate between DynamoDB and Amazon S3. **[6]**

c) Write short note on Windows Azure Platform architecture. **[6]**

Q1) a) Write a short note on **[6]**

i) Amazon Elastic Block Store (EBS)

ii) Amazon ElasticCache

b) Explain the Programming environment of Google App Engine. **[6]**

c) Write short note on following standards of application developer. **[6]**

i) LAMP

ii) LAPP

OR

Q2) a) Explain Windows Azure Platform Architecture with the help of a neat diagram. **[6]**

b) Write short note on **[6]**

i) Amazon CloudFront

ii) Amazon S3

c) Explain following Amazon Database Service **[6]**

i) Amazon Relational Database Service (RDS)

ii) Dynamo DB

Q1) a) What are the different standards for application developers on cloud platform? **[8]**

b) Differentiate between cloud and grid. **[4]**

c) What are the main elements in windows Azure. Explain the significance of each. **[6]**

OR

Q2) a) How are Spot Instance, On-demand Instance, and Reserved Instance different from one another in Amazon web services. **[6]**

b) Explain the architecture of Google App Engine with neat diagram. **[8]**

c) Explain the significance of Open Cloud Test-bed. **[4]**

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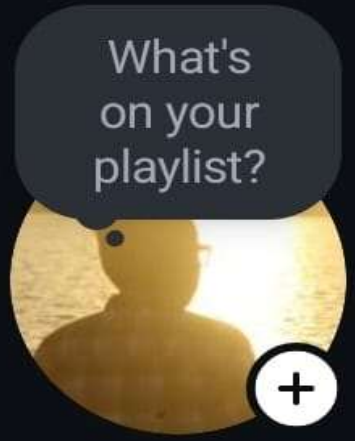

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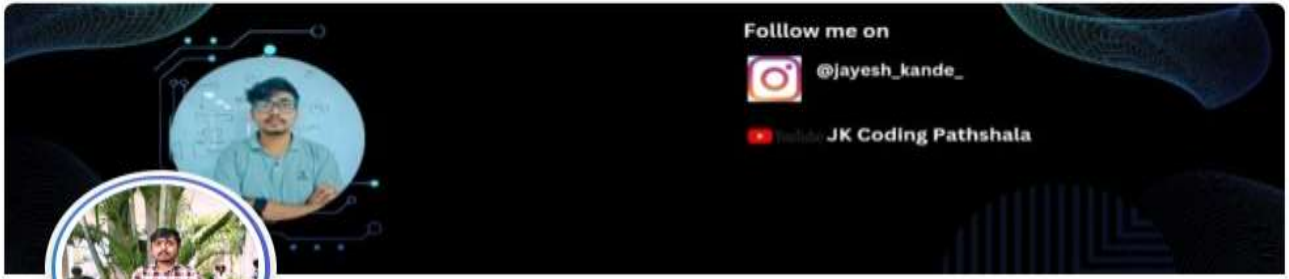

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