

Cloud Computing

Assgn

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Q1) Mobile application Use case. (Decide Public/Private Cloud)

- ↑↑ Userbase , high traffic volume
- Security & sensitive user data stored.
- cost effective sol'n needed .

Public Cloud Adv

(i) Cost Saving : Don't hv to buy / install servers
~~(Do not)~~

(ii) Scalability : Offers elastic resources , allowing dynamic scaling w/ user demand

(iii) No Maintenance : Provider handles all of maintenance & infra updates

Public Cloud Disadv

(i) Lack of proper control : business has lesser control over exact specifications & optimisations

Weak on security

Since infra is shared w/ other orgs , user data is @ high risk

Performance

If resources are shared amg multiple clients , performing issue might crop up .

public cloud Adv

(IV) Location Indep:
Services are delivered
through the Internet

(V) Flexibility: Easy to integrate
w/ private cloud.

Private Cloud Adv

(i) Enhanced Security: company has
full autonomy over security protocols,
ensuring sensitive data is safe.

(ii) Total Control: Infra can be tailored
to meet specific perf & compliance
requirements.

(iii) Better Performance: Since resources
are dedicated there is no risk of
fluctuation

(iv) Improved Compliance: Private
cloud can help to follow
industry regulations.

Private Cloud Disadv

(i) Higher costs: requires significant
capital expenditure

(ii) Limited Scalability

(iii) Maintenance Reliability.

(iv) Geographic Limitations:
private cloud may not hr. the
global presence of a public cloud,
potentially affecting experience

Q2

Cloud platform → experiencing intermittent issues

The root cause for the connectivity issues would be:

- (i) Network congestion
- (ii) Cloud Provider downtime
- (iii) Insufficient Resources
- (iv) Misconfigured load balancers
- (v) Database Bottlenecks.

Steps to resolve the issues

- Monitor cloud services using tools like AWS Cloud Watch or Azure Monitor to identify bottlenecks
- Upgrade to more reliable networks
- Implement auto-scaling by automatically provisioning more resources during peak demand -

Ensuring High Avail & Perf.

- 1) Load Balancing: Distribute incoming traffic across multiple servers to prevent overload.
- 2) Have data redundancy in case of data loss.
- 3) Use failover systems to ensure high availability
- 4) Multi-region Deployment
 - Deploying the app across multiple locations.

5) CDN (Content Delivery Network)

- Cache static content closer to user.

6) Auto scaling Add or remove cloud resources based on real-time demand automatically.

Comparison of Major Cloud Providers:

1) AWS

- largest ~~biggest~~ cloud provider, vast services, good security
- complex pricing, steep learning curve
- Pay as you go, payment model
- Good for scalable web-apps.

2) Microsoft Azure

- Strong integration w/ Microsoft products
- Can be expensive limited global data centers
- Pay as you go, reserved VM pricing
- Good for hybrid cloud, enterprise software

3) GCP:

- Has AI/ML capabilities, strong networks
- Smaller market share, fewer enterprise sales
- Pay-as-you-go, sustained user discounts.
- Best for AI-ML workloads, network heavy apps.

Recommended Cloud Providers

- AWS is the best choice due to its scalability, robust security features and wide range of services.
- It offers auto scaling & load balancing.

- Scenario Questions

Q1) Cloud-Based Disaster Recovery w/ IaaS:

'IaaS providers like AWS offer automated backups solutions that create frequent snapshots of data.'

- If an attack occurs IaaS allows ~~the~~ company to failover to a different cloud region & scale accordingly.
- Data can be replicated across multiple regions to prevent data loss due to local failures.

Q2) ~~Virtualisation~~ Virtualisation for Cost Reduction & Efficiency.

- Virtualisation allows multiple VMs to run on a single phy. server, reducing no. of machines needed.
- Fewer phy. servers mean lower power consumption, cooling costs, & hardware expenses.
- Virtualized machines can be backed up, cloned or moved b/w phy. servers w/out downtime.

Q3) Load Balancing for website performance during NIFTCC

- Load balancers distribute traffic across multiple servers, preventing a server from being overloaded
- If demand peaks, auto-scaling provisions additional servers dynamically
- If a server fails, traffic is rerouted to healthy servers, ensuring zero down time.

Q4) Load Balancing for High Avail. in Banking App:

- Load balancing spreads traffic across multiple data centers for redundancy
- If a primary server fails, traffic is redirected to a backup server w/o no down time.
- Load balancers continuously monitor server health, rerouting traffic away from failing nodes.

Q5) Best Hosting service for small Bank Website

- The best hosting service is shared hosting or website builder on a public cloud.

Why?: Low cost: Shared hosting is affordable as multiple websites share a server.

- Easy setup: No technical expertise is required.
- Managed services: The provider handles main tenance, security & updates.
- Sufficient for low traffic: A basic shared hosting plan or cloud ~~hosting~~ hosting on AWS light sail or Google sites is enough.

Outcome: The bakery gets an affordable easy to ~~maintain~~ maintain website that meets its needs without overspending.

Note:

7 questions answered.