Cloud Computing Architecture – Revision Notes

Major Building Blocks of Cloud Architecture

Technical Architecture

- Follows **XaaS stack** structure
- Includes:
  - Cloud service/components structuring
  - Middleware & communication
  - Management & security
  - External endpoints mapping
  - Adoption of cloud paradigms

Deployment & Operation Architecture

- Includes **Geo-location checks** (e.g., legal/export control issues)
- **Monitoring and operations management**

XaaS (Anything as a Service)

- **Core of cloud computing**
- Delivers services **via the Internet**
- Combines:
  - **Broad network access (cloud)**
  - **Resource pooling (cloud)**
  - **On-demand business infrastructure (SOI)**
  - **Service orientation (SOI)**

XaaS = Cloud (broad access + pooling) + SOI (infra + service) ✓

Types of XaaS

Model	Use
SaaS	Software apps over the web (e.g., Google Docs)
PaaS	Tools/services to build & deploy apps
IaaS	Virtualized hardware & software (e.g., servers, OS)
BPaaS	Business processes as a service
SECaaS	Security as a service
DaaS	Database or Desktop as a service
BaaS	Backup as a service
IDaaS	Identity management as a service
CaaS	Content/communication as a service
MaaS	Monitoring/management as a service
Storage as a Service	Cloud-based storage solutions

Cloud Service Provider (CSP) Goals

- Increase:
  - **Productivity**
  - **User satisfaction**
  - **Innovation**
  - **Agility**

Classical Service Model (Legacy IT)

- All layers managed by user (hardware to apps)
- Requires **high IT budget**, **manual operations**
- **Custom-built**, vertical, tightly coupled systems
- Hard to replace parts or scale

Client-Server Architecture

- One or more **load-balanced servers** handle client requests
- **Request-response model**
- **Thin client** (low computational power)
- Server may be **standalone or clustered**

Client-Server vs Cloud Model

Client-Server Model	Cloud Computing Model

Simple service model	Complex XaaS models
Limited scalability	Theoretically infinite
No virtualization	**Virtualization is core**
May not be load-balanced	**Load-balanced**

Simplified Cloud Service Models

Model	**Purpose**
SaaS	For **end users**, over the web
PaaS	For **developers**, build & deploy
IaaS	**Hardware & OS layer** (foundation)

Transportation Analogy

- **Infrastructure = Roads** (like IaaS)
- **Platform = Vehicles** (like PaaS)
- **Software/Data = Passengers/Goods** (like SaaS)
- Roads alone aren't useful — vehicles make them productive

Likely MCQ Triggers

- Full form of **XaaS**, **SaaS**, **PaaS**, **IaaS**
- What's managed in **Classical Model vs Cloud**
- Difference between **Client-Server and Cloud**
- Benefits of **XaaS** and types
- Role of **virtualization** in cloud
- **Service layers** responsibilities
- Cloud analogies (e.g., **transportation** analogy)