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Cloud Computing Notes PDF

Cloud computing delivers computing resources such as servers, storage, databases and software over the internet on a pay-as-you-use basis. These notes explain the five essential characteristics, the IaaS, PaaS and SaaS service models, public, private and hybrid deployment, virtualisation, containers, regions, storage types, networking, security responsibility and cost control.

Key takeaways

- The three service models are IaaS, PaaS and SaaS, differing in how much you manage.
- Deployment models are public, private, hybrid and multi-cloud.
- Security is shared: the provider secures the platform, you secure your data and access.
- Regions and availability zones are the basis of availability and latency choices.
- Cost control needs tagging, budgets, right-sizing and turning off idle resources.

What is cloud computing notes?

Cloud computing is the on-demand delivery of computing resources, such as servers, storage, databases, networking and software, over the internet with pricing based on usage.

What are the essential characteristics of cloud?

A widely used definition from the US National Institute of Standards and Technology lists five: **on-demand self-service** (you provision resources yourself), **broad network access** (use from many devices), **resource pooling** (shared infrastructure for many customers), **rapid elasticity** (scale up and down quickly) and **measured service** (pay for what you use). These explain why cloud differs from buying and running your own servers.

What are the service models?

Model	You manage	Provider manages	Example idea
IaaS	OS, runtime, apps, data	Hardware, virtualisation, network	Rented virtual machine
PaaS	Apps and data	Everything below the app	Managed app hosting
SaaS	Your settings and data	The whole application	Email, CRM, office tools
FaaS / serverless	Function code	Servers, scaling	Run code on an event

Moving from IaaS toward SaaS means less control and less work to operate.

What are the deployment models?

Public cloud: shared infrastructure run by a provider. **Private cloud:** infrastructure used by one organisation, on site or hosted. **Hybrid cloud:** a mix of private and public, connected. **Multi-cloud:** using more than one public provider. Choose based on regulation, cost, skills and the need to avoid depending on one provider.

What is virtualisation and how do containers differ?

Virtualisation lets one physical machine run several virtual machines, each with its own operating system, through a hypervisor. Containers share the host operating system kernel and package an app with its dependencies, so they start faster and use less memory. Orchestrators such as Kubernetes manage containers at scale.

What are regions and availability zones?

A region is a geographic area with several isolated availability zones. Placing an application in more than one zone protects it from a single data centre failure. Choose a region by user distance, data rules, service availability and price.

What storage types exist?

Object storage holds files as objects with metadata, suited to backups, media and data lakes. **Block storage** is like a disk attached to a server, suited to databases and operating systems. **File storage** gives shared network folders. Each type has different speed, cost and access patterns.

What do I need to know about networking?

A virtual private network in the cloud has subnets, route tables, gateways and firewalls (security groups and network rules). Public subnets can be reached from the internet, private ones are reached only from inside. Use a load balancer to spread traffic, DNS to name services and a content delivery network to serve content close to users.

How does the shared responsibility model work?

The provider secures the physical sites, hardware and core services. You secure your data, user access, application code, configuration and, for IaaS, the operating system. Most cloud breaches come from misconfiguration, such as open storage or weak access rules, not from the provider's data centres.

What are the main security practices?

Use multi-factor authentication, least-privilege roles, encryption in transit and at rest, logging and monitoring, regular patching, network segmentation and backups that you test. Never share keys in code.

How do I control cost?

Tag resources by owner and project, set budgets and alerts, right-size servers, shut down idle resources, use reserved or committed discounts for steady loads, choose cheaper storage classes for rarely used data and review the bill monthly. Cloud is flexible, but unused resources still cost money.

What are benefits and risks?

Benefits include speed, scale, access to managed services and lower upfront cost. Risks include unexpected bills, skill gaps, dependence on a provider, data location rules and complexity. A clear plan addresses each.

How do I start learning cloud practically?

Create a practice account with a budget alert, launch a small virtual machine, store a file in object storage, deploy a simple web page and then delete everything. Draw the architecture of what you built. Next, repeat the same exercise on a second provider at a high level to see that the ideas match even when names differ, which is the best way to avoid depending on one vendor's vocabulary.

What certificates and learning paths exist?

Major providers offer foundation-level certifications that check concepts, and role-based ones for developers, administrators and architects. Certificates can structure your study but do not replace hands-on practice. Check each provider's official page for the current exam outline, fees and rules before you decide.

What are common cloud terms?

Elasticity is automatic scaling with demand. **Scalability** is the ability to handle growth. **High availability** means the service stays up despite failures. **Fault tolerance** means it keeps working through a component failure. **Latency** is the delay before a response. **SLA** is the uptime a provider commits to. **Multi-tenancy** means several customers share infrastructure while staying isolated. Knowing these words lets you read provider documentation easily.

Frequently asked questions

What is cloud computing?

It is the on-demand delivery of computing resources such as servers, storage, databases and software over the internet with usage-based pricing.

What is the difference between IaaS, PaaS and SaaS?

IaaS rents infrastructure, PaaS provides a platform to run your app and SaaS delivers complete software, with decreasing control and operating effort.

What is a hybrid cloud?

A hybrid cloud combines private infrastructure with public cloud services and connects them.

Who is responsible for cloud security?

Responsibility is shared. The provider secures the platform, and the customer secures data, access and configuration.

How can I reduce cloud costs?

Tag resources, set budgets, right-size servers, shut down idle resources and choose suitable storage classes.

Sources and further reading

- NIST: Definition of Cloud Computing (SP 800-145)
- AWS documentation
- Kubernetes documentation

About this PDF

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