



Cloud Computing Fundamentals

A simplified, activity-based guide to networks, cloud models, services, and global infrastructure

What we'll cover



Foundations

Networks, distributed, grid & cloud computing — what's the difference?



Cloud Models

Public, private, and hybrid cloud.



Benefits & Costs

Why cloud, and how you pay for it.



Cloud Services

IaaS, PaaS, SaaS, and who manages what.



Global Infrastructure

Providers, regions, and availability zones.



Pricing

What drives cost, and how to estimate it.



ACTIVITY 1 OF 8

What would you choose?

A group of universities around the world links their spare computer processing power together over the internet, so they can jointly crunch one huge genome-sequencing task. What best describes this setup?

A

A simple office network

B

Grid computing

C

A public cloud subscription

D

Software as a Service (SaaS)



ACTIVITY 1 OF 8 · ANSWER

Here's the answer

A

A simple office network

B

Grid computing



C

A public cloud subscription

D

Software as a Service (SaaS)



They're pooling independent, geographically spread machines — owned by different institutions — to work together on one shared task. That's the hallmark of grid computing, not just a network, a cloud subscription, or an app.

CONCEPT

Networks, Distributed, Grid & Cloud Computing

Four related ideas that are easy to mix up — here's how they differ.



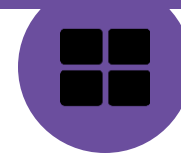
Network

Connects devices so they can communicate and share resources like files or a printer, within a building or across the globe.



Distributed Computing

Splits one job across several connected computers that work together and appear as a single system to the user.



Grid Computing

Pools spare computing power from many machines — often owned by different organizations — to tackle one large shared task.



Cloud Computing

Delivers on-demand computing resources — servers, storage, software — over the internet, managed and billed by a provider.



ACTIVITY 2 OF 8

What would you choose?

A retail chain wants full control over sensitive customer data inside its own datacentre, and has no interest in serving anyone outside the organization from that infrastructure. Which cloud model fits best?

A

Public cloud

B

Private cloud

C

Hybrid cloud

D

Grid computing



ACTIVITY 2 OF 8 · ANSWER

Here's the answer

A

Public cloud

B

Private cloud



C

Hybrid cloud

D

Grid computing



A dedicated, organization-owned environment used only by internal users is exactly what private cloud means — self-service infrastructure that never leaves the company's own datacentre.

CONCEPT

Cloud Models: Public, Private & Hybrid

The three ways an organization can consume cloud resources.



Public Cloud

Owned by a provider, shared by many organizations, accessed over a secure internet connection.



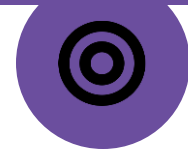
Private Cloud

Built inside an organization's own datacentre; dedicated and self-service, for internal users only.



Hybrid Cloud

Combines public and private, so each workload runs wherever it fits best — cost, control, or scale.



Choosing

Weigh control, compliance, cost and scale needs — most organizations end up using more than one model.



ACTIVITY 3 OF 8

What would you choose?

An online retailer's traffic spikes 10x during a flash sale, then drops back to normal overnight — and their infrastructure automatically grows and shrinks to match, with no manual intervention. Which cloud benefit are they relying on?

A

Elasticity

B

Fault tolerance

C

Global reach

D

Agility



ACTIVITY 3 OF 8 · ANSWER

Here's the answer

A

Elasticity



B

Fault tolerance

C

Global reach

D

Agility



Resources expanding and shrinking automatically to match demand — in both directions — is elasticity. Scalability is the ability to grow; elasticity adds the automatic, two-way part.

CONCEPT

Cloud Benefits

Why organizations move to the cloud.



Fault tolerance

Keeps running through component failure



High availability

Minimal downtime, always reachable



Scalability

Add resources as demand grows



Elasticity

Auto-adjusts up and down with demand



Global reach

Deploy close to users worldwide



Agility

Spin up resources in minutes



Disaster recovery

Fast recovery when things go wrong



Security

Provider-grade protection & compliance



ACTIVITY 4 OF 8

What would you choose?

A startup wants to avoid a large upfront investment in servers, and instead pay a monthly bill based only on what it actually uses. Which spending model does this describe?

A CapEx

B OpEx

C Fixed licensing

D Grid allocation



ACTIVITY 4 OF 8 · ANSWER

Here's the answer

A

CapEx

B

OpEx



C

Fixed licensing

D

Grid allocation



Paying only for what you consume, billed as you go with no big upfront purchase, is Operational Expenditure (OpEx) — the model cloud providers are built around.

CONCEPT

CapEx vs. OpEx

Two very different ways to pay for IT infrastructure.



CapEx

- Up-front spending on physical infrastructure
- Value depreciates — reduces over time
- Deducted from tax bill gradually, over years



OpEx

- Pay for products and services as needed
- Billed immediately, pay-as-you-go
- Deducted from tax bill in the same year

Consumption-based model: cloud providers charge only for resources actually used — better cost prediction, no idle infrastructure sitting unused.



ACTIVITY 5 OF 8

What would you choose?

A developer wants to write and deploy an application quickly, without managing servers, operating system patches, or networking themselves. Which cloud service model fits?

A IaaS

B PaaS

C SaaS

D On-premises



ACTIVITY 5 OF 8 · ANSWER

Here's the answer

A

IaaS

B

PaaS



C

SaaS

D

On-premises



A ready-to-use environment for building and deploying apps, where the provider handles the infrastructure underneath, is Platform as a Service — think AWS Elastic Beanstalk or Azure App Service.

CONCEPT

IaaS, PaaS & SaaS

The three layers of cloud service, from most to least hands-on.



IaaS

Rent servers, storage, networks & OS. Most flexible — you manage everything above the hardware. e.g. AWS EC2.



PaaS

A ready-made environment to build & deploy apps, without managing infrastructure. e.g. Azure App Service.



SaaS

Fully-built apps used over the internet — nothing to install or maintain. e.g. Microsoft 365, Gmail.



Choosing

Match the model to how much control you need versus how much you want the provider to handle.



ACTIVITY 6 OF 8

What would you choose?

In a SaaS product like a cloud email service, who is responsible for patching the underlying operating system?

A

You, the customer

B

The cloud provider

C

Both, equally

D

Neither — it isn't patched



ACTIVITY 6 OF 8 · ANSWER

Here's the answer

A

You, the customer

B

The cloud provider



C

Both, equally

D

Neither — it isn't patched

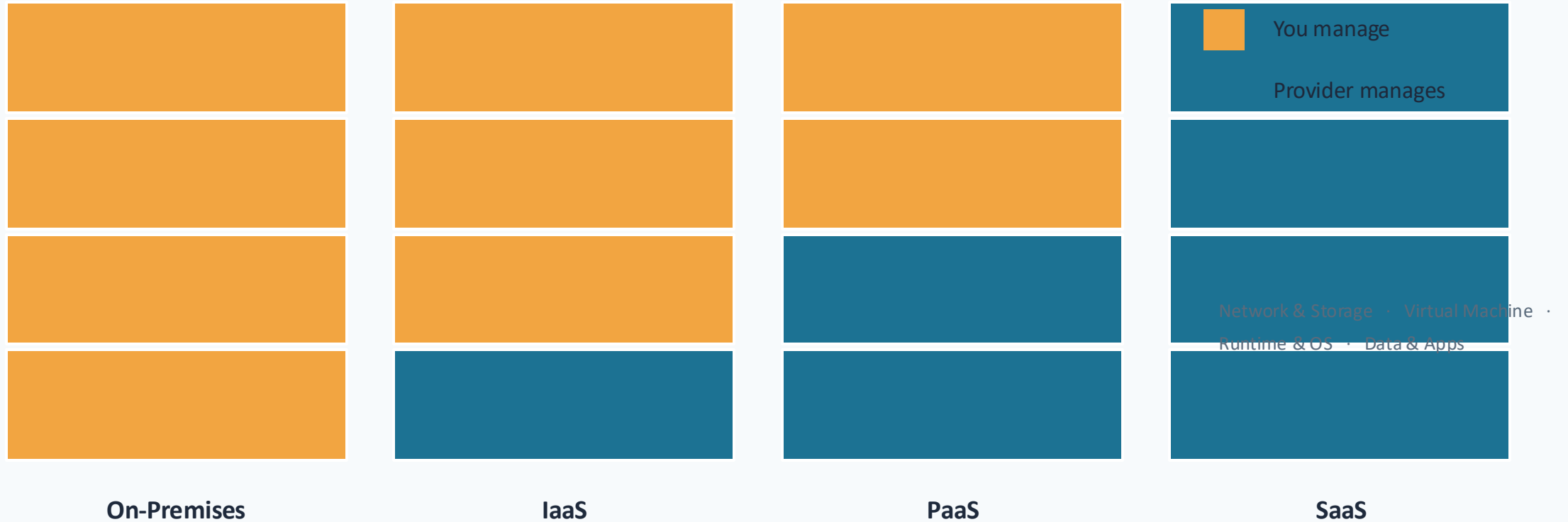


In SaaS, the provider manages everything below the application — OS, virtual machine, networking and storage — so patching the OS is on them, not you.

CONCEPT

Shared Responsibility Model

The more the provider manages, the less infrastructure work is left for you.





ACTIVITY 7 OF 8

What would you choose?

A company wants automatic protection if an entire datacentre fails, while staying within the same region and keeping latency low. What should they design around?

A

A single virtual machine

B

Availability Zones

C

Edge locations

D

Region pairs



ACTIVITY 7 OF 8 · ANSWER

Here's the answer

A

A single virtual machine

B

Availability Zones



C

Edge locations

D

Region pairs



Availability Zones are physically separate datacentres within one region, each with independent power, cooling and networking — so one zone failing doesn't take down the others.



Providers & Global Infrastructure

The major providers compete on worldwide scale and reliability.



Major providers

AWS, Microsoft Azure, Google Cloud and IBM Cloud are the leading global cloud platforms.



AWS

24+ global regions split into Availability Zones, plus 216+ edge locations (CloudFront) that cache content and guard against DDoS attacks.



Azure

60+ regions across 140+ countries; regions are paired 300+ miles apart for disaster recovery.



Geographies

Regions are grouped into geographies to preserve data residency and meet local compliance needs.



ACTIVITY 8 OF 8

What would you choose?

A finance team wants to estimate the monthly cost of a planned virtual machine before committing to it. What tool should they use?

A

Shared responsibility model

B

A pricing calculator

C

An availability zone map

D

A service level agreement



ACTIVITY 8 OF 8 · ANSWER

Here's the answer

A

Shared responsibility model

B

A pricing calculator



C

An availability zone map

D

A service level agreement



Pricing calculators (Azure Pricing Calculator, AWS Pricing Calculator) let you configure region, tier and billing options to generate a cost estimate — not a final invoice, but a solid planning tool.

CONCEPT

Cloud Pricing

What drives the bill, and how to plan for it.



What drives cost

- Resource type & service type
- Location / region
- Billing model & bandwidth
- Hybrid benefit discounts



Pricing calculators

- Configure region, tier & support options
- Generate a cost estimate before you buy
- Estimates only — not a final invoice

Both Azure and AWS offer free online pricing calculators — a good habit before provisioning anything new.



KEY TAKEAWAYS

Recap: Cloud Computing in a nutshell



Cloud computing delivers on-demand IT — compute, storage, networking, analytics — over the internet.



Three models: public, private, and hybrid — chosen by control, cost, and compliance needs.



Three service layers: IaaS, PaaS, SaaS — each hands over more to the provider.



Pay-as-you-go (OpEx) means you're billed for what you actually consume.



Key benefits: elasticity, availability, global reach, and disaster recovery.



Responsibility is always shared — the split just moves depending on the service model.



Questions?

Thanks for joining — let's keep building cloud confidence.