A PRIMER ON CLOUD COMPUTING

# The Cloud *Shift.*

*Fundamentals of cloud computing — empowering digital transformation through on-demand infrastructure.*

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FIRST PRINCIPLES

# What is *the cloud?*

A working definition, an analogy, and the strategic shift it enables.

DEFINITION

The on-demand delivery of IT resources — servers, storage, databases — over the internet, with pay-as-you-go pricing.

ANALOGY

*You don't build a power plant to turn on a lightbulb. You plug into a grid and pay only for what you use.*

THE SHIFT

~~CapEx~~ → *OpEx*

Buying hardware → paying for services

DEFINING TRAITS

# Five essential characteristics

As defined by the U.S. National Institute of Standards & Technology

01 I.

## On-demand self-service

Provision resources automatically — no human in the loop.

02 II.

## Broad network access

Reachable from phones, tablets, laptops — anywhere.

03 III.

## Resource pooling

Many tenants share the same physical infrastructure.

04 IV.

## Rapid elasticity

Scale up or down instantly to match demand.

05 V.

## Measured service

You're billed for actual usage — metered, not flat.

WHAT YOU CONSUME

# The service stack

The further up the stack, the less you manage and the more the vendor abstracts away.

LAYER 03 · TOP — SaaS

## Software *as a service*

Ready-to-use applications, fully managed by the vendor. You log in and work.

IN THE WILD

*Salesforce, Microsoft 365*

LAYER 02 · MIDDLE — PaaS

## Platform *as a service*

Frameworks and runtimes for developers to build and deploy applications.

IN THE WILD

*Heroku, Google App Engine*

LAYER 01 · BASE — IaaS

## Infra*structure* *as a service*

Raw building blocks — virtual servers, networking, storage. You bring the OS up.

IN THE WILD

*AWS EC2, Azure VMs*

← YOU MANAGE LESS

*More abstraction · Less control*

YOU MANAGE MORE →

WHERE IT RUNS

# Deployment models

What you consume is one question.
Where it runs is another.

## i Public SHARED

Resources owned and operated by a third-party provider — AWS, Azure, GCP — and shared by many organizations on common infrastructure.

## ii Private DEDICATED

Cloud resources used exclusively by one organization — hosted on-premises or in a dedicated facility with a provider.

## iii *Hybrid* COMBINED

A mix of public and private clouds, allowing data and applications to move between them — typically driven by regulation or latency.

## iv *Multi-cloud* DISTRIBUTED

Workloads spread across multiple providers — AWS plus Azure, for example — to avoid vendor lock-in and combine best-of-breed services.

THE BUSINESS CASE

# Why organizations *migrate.*

~0%

## Cost savings

No upfront hardware. Lower maintenance overhead. Capacity matched to load.

min.

## Speed & agility

Spin up a global server in minutes — not weeks waiting on hardware delivery.

500%

## Scalability

Absorb a 5× traffic spike during a launch without re-architecting overnight.

24/7

## Disaster recovery

Redundancy across global data centers — built in, not bolted on.

*"Cost savings is the headline. Speed and resilience are usually what closes the deal."*

SECURITY MODEL

# Shared responsibility.

*Security is split — knowing where the line sits is half the job.*

THE PROVIDER

## Security *of* the cloud.

The physical data centers. The hardware. The networking cables. The hypervisor running underneath.

THE CUSTOMER

## Security *in* the cloud.

Their data. Their passwords and identities. Their application code. Their access policies.

THE GOLDEN RULE

CONCLUSION

# What comes *next.*

*Cloud is the engine of digital transformation — shifting focus from "keeping the lights on" to building what comes next.*

i TREND 01

## Serverless

Run code without managing servers at all. Ship a function, the platform handles the rest.

ii TREND 02

## Edge computing

Process data closer to the user — lower latency, better experience at the network edge.

iii TREND 03

## AI & ML integration

On-tap access to the compute that used to require a research lab — for any team, at any scale.