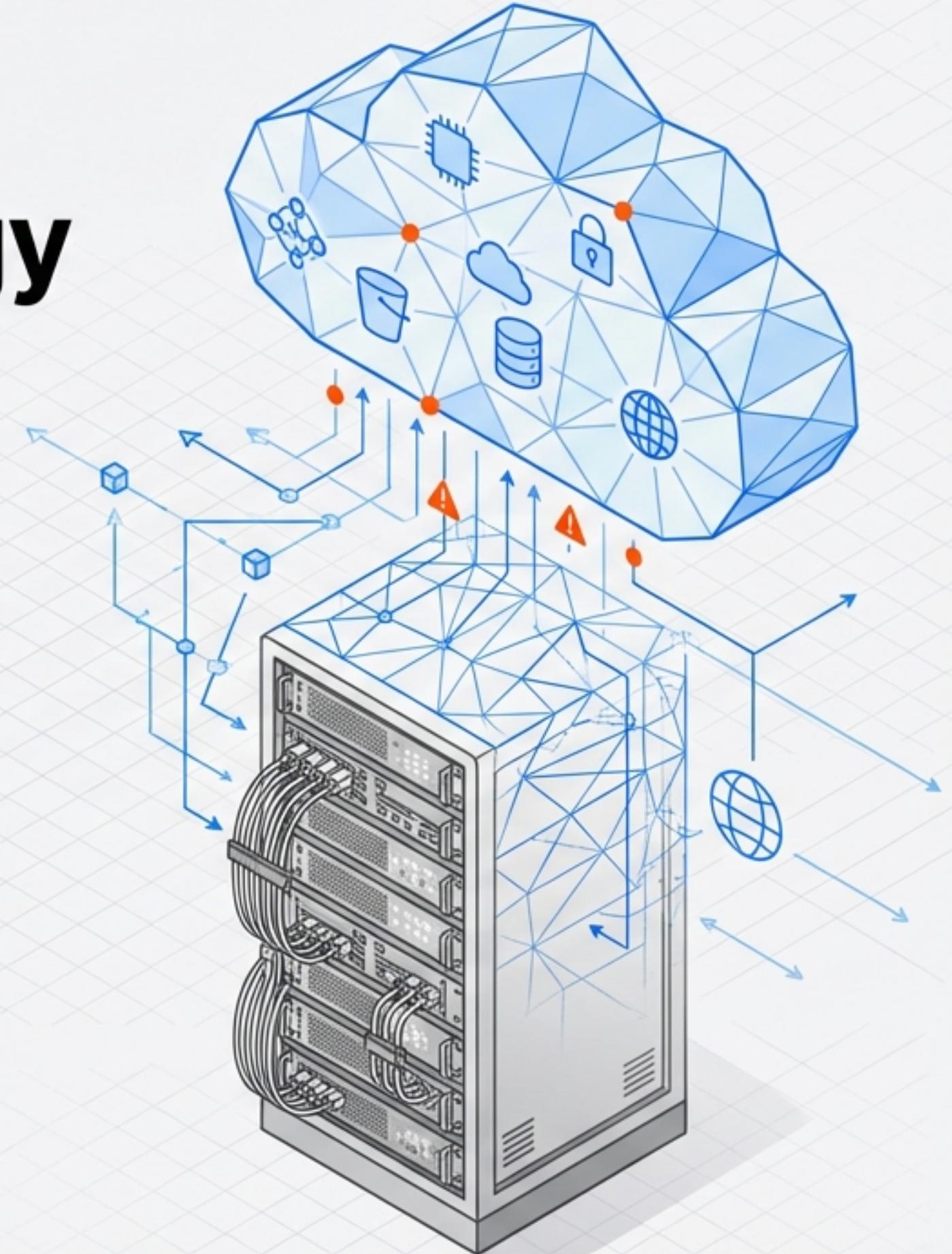


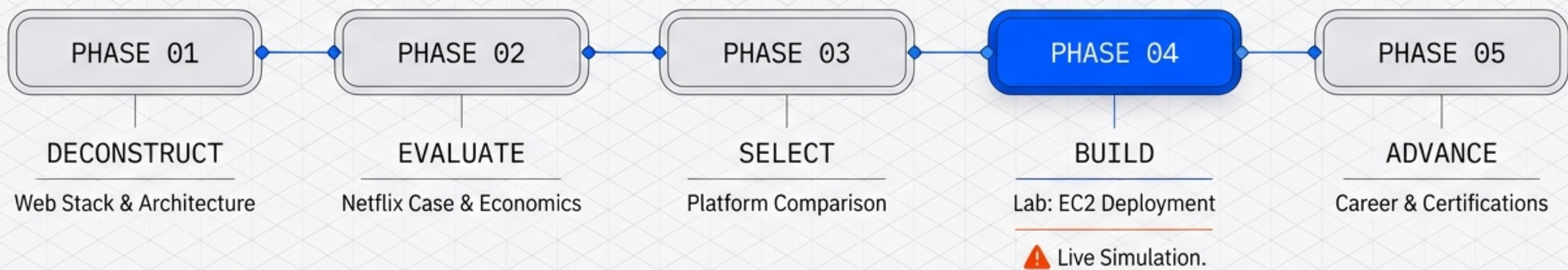
# Cloud Architecture & AWS Deployment Strategy

From bare metal infrastructure to global scale: A practical guide for engineers.

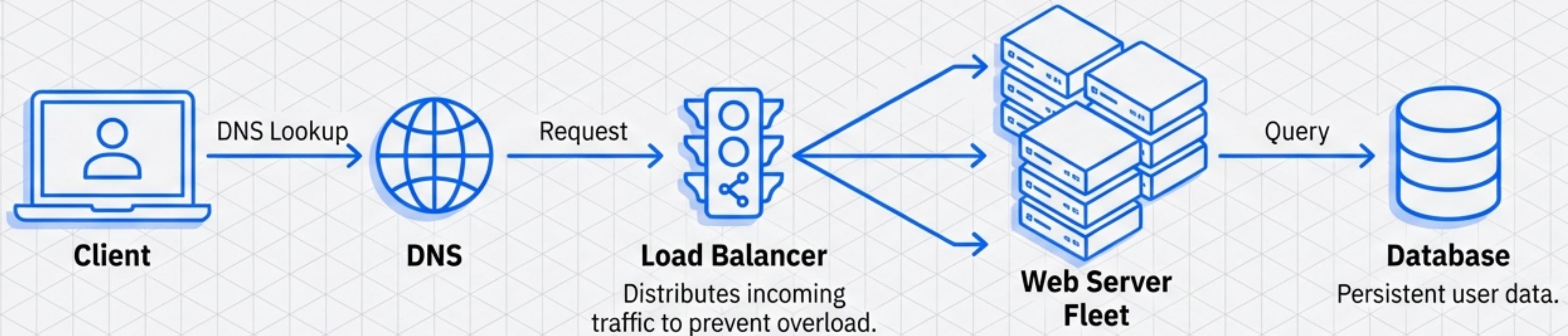
**TARGET:** B.Tech Sem 6  
**FOCUS:** Architecture, Cost Models, Live Deployment  
**STATUS:** Production Ready



# THE ENGINEERING AGENDA: FROM THEORY TO EXECUTION



# DECONSTRUCTING THE WEB REQUEST

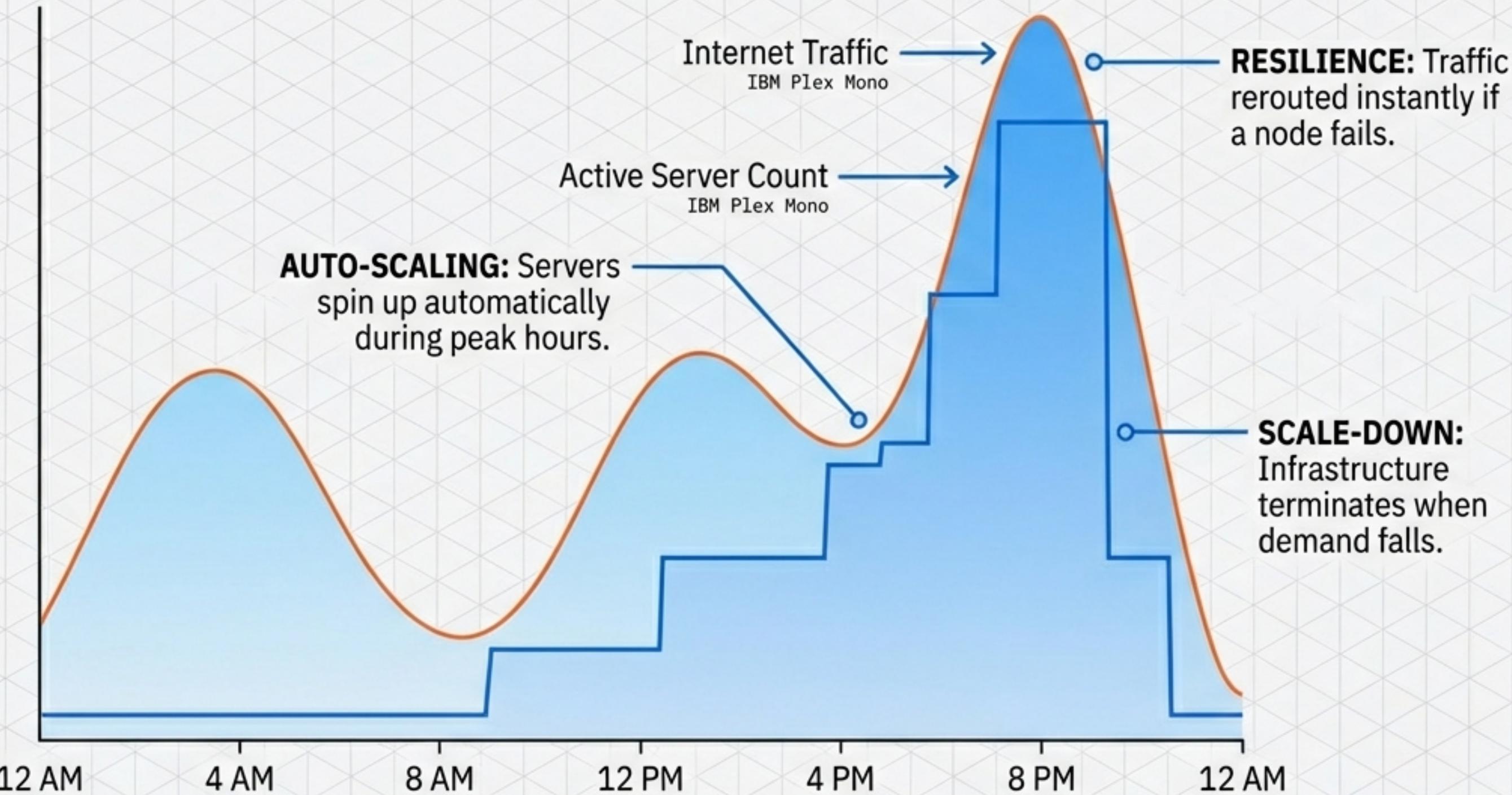


## VOCABULARY:

**Latency** = **Speed** (Time to first byte)

**Throughput** = **Volume** (Requests per second)

# ARCHITECTURE AT SCALE: THE NETFLIX CASE STUDY



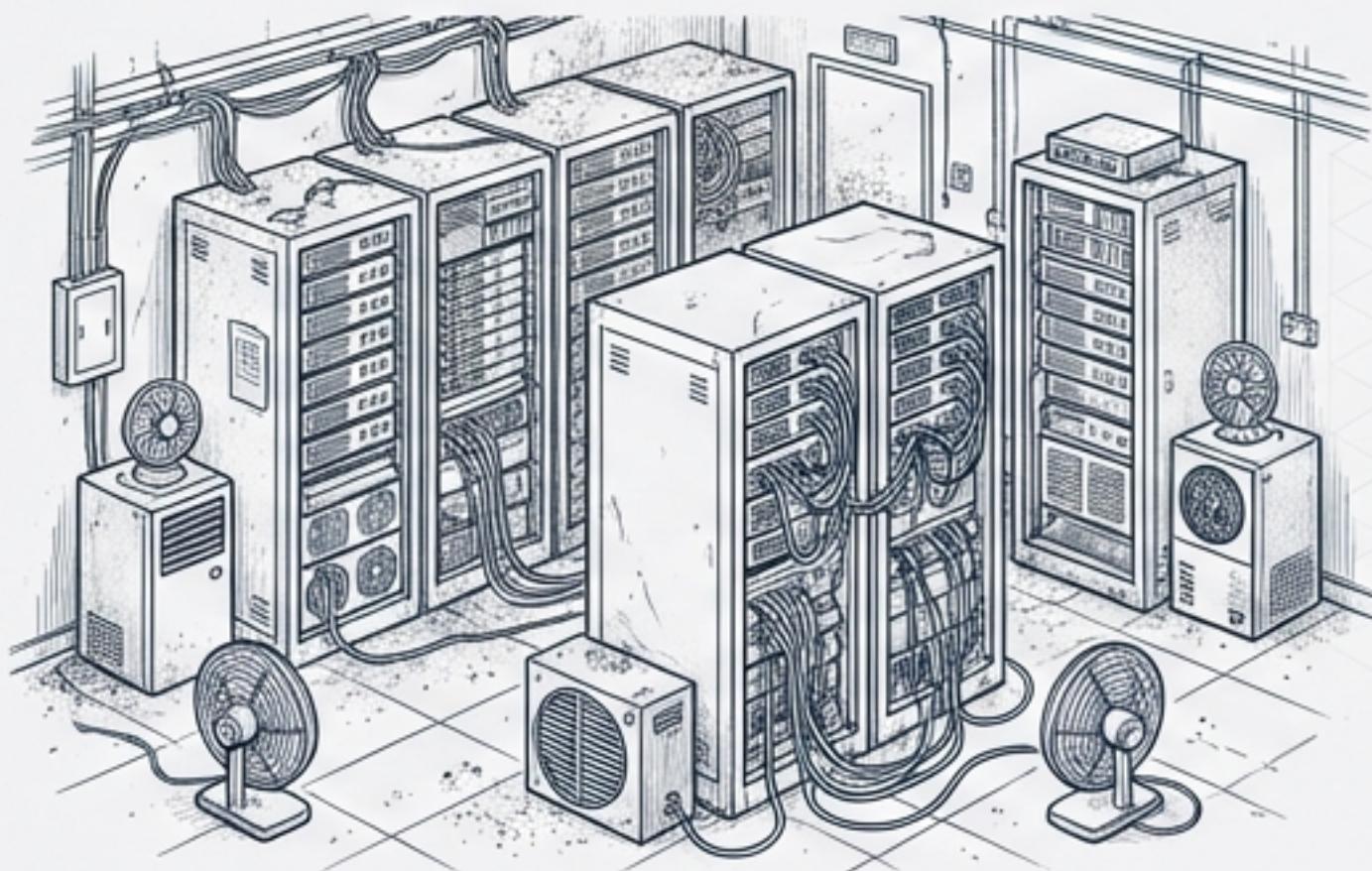
**THE PROBLEM:**  
Millions of concurrent streams.

**THE SOLUTION:**  
Elasticity.

**NETFLIX DOES NOT BUILD DATA CENTERS; THEY RENT UTILITY.**

# THE ECONOMIC SHIFT: CAPEX VS. OPEX

## CapEx (Capital Expenditure)



- Upfront Hardware Cost
- Depreciation
- Pay for idle time

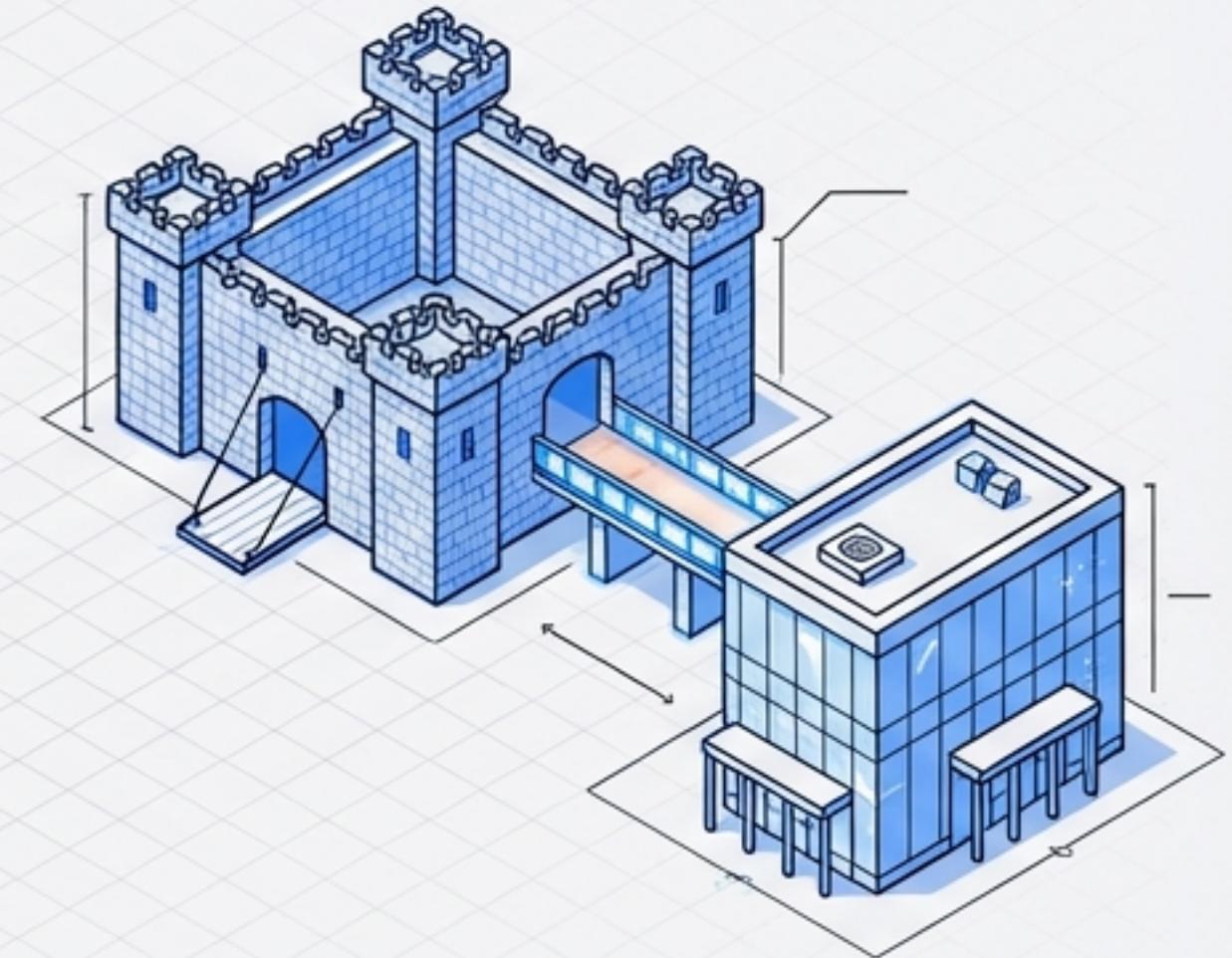
## OpEx (Operational Expenditure)



SAMPLE MONTHLY BILL	
Compute:	\$0.05/hr × 720 hrs = \$36.00
Storage:	\$0.02/GB × 100 GB = \$2.00
Total:	<b>\$38.00 / month</b>

- Pay-as-you-go
- Zero Upfront Cost
- Variable Expense

# Selecting the Environment: Deployment Strategies



## PUBLIC CLOUD

Shared Infrastructure (AWS/Azure)

- Use Case: Web Apps, Netflix

## PRIVATE CLOUD

On-Premise Data Center

- Use Case: Sensitive Banking Data

## HYBRID CLOUD

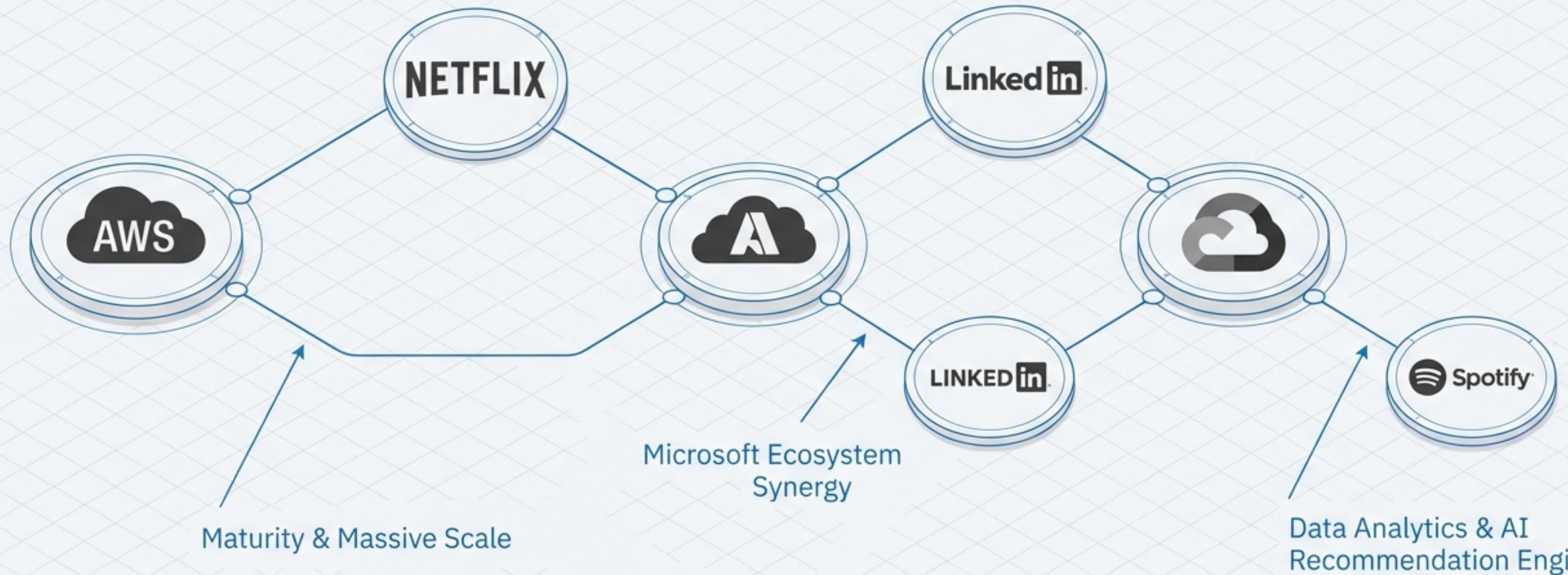
Connected Legacy Systems

- Use Case: Govt Migrations

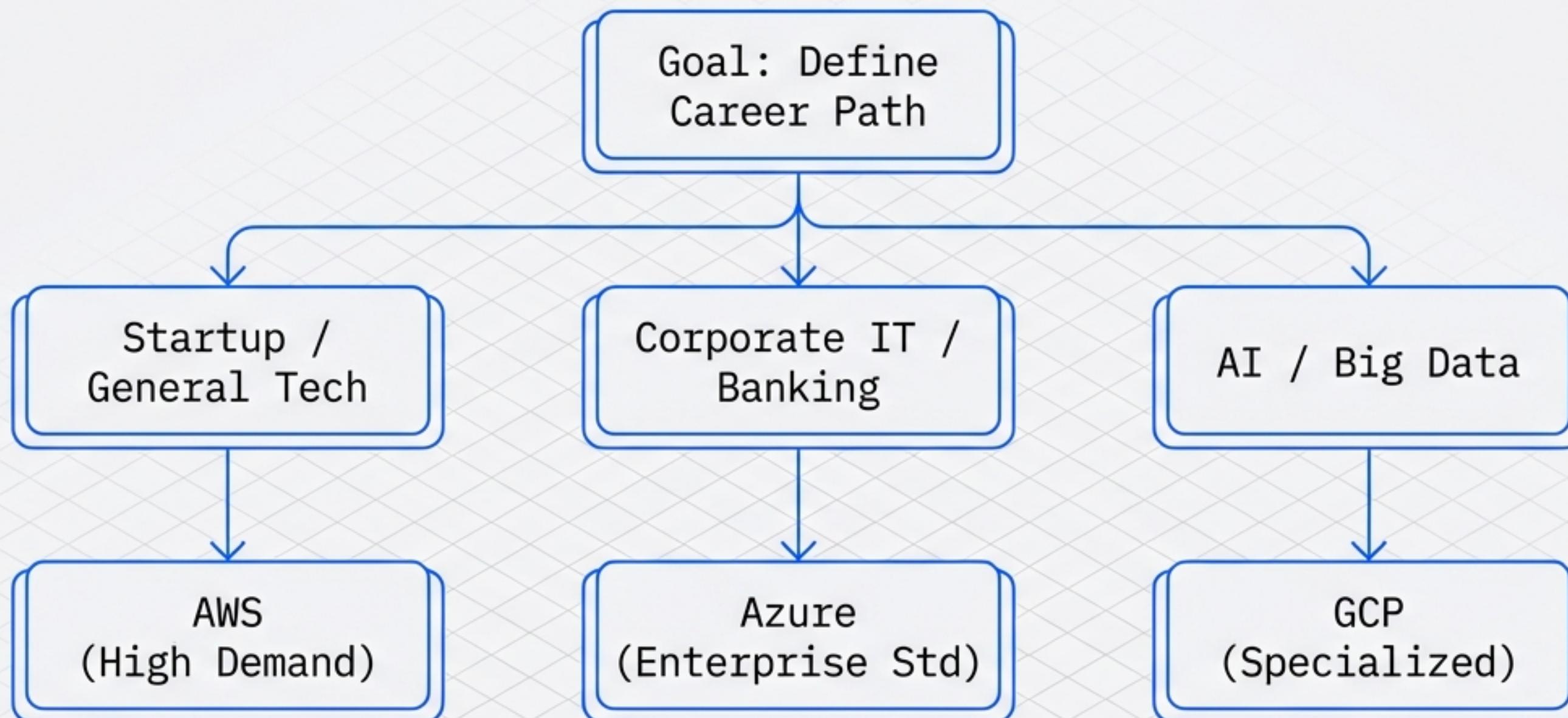
# The Big Three: Platform Capabilities Matrix

Feature	AWS (Amazon)	Azure (Microsoft)	GCP (Google)
Market Share	32% (Leader)	23%	10%
Primary Strategy	First-Mover, Service Width	Enterprise Integration	Open Source & Data
Core Strength	Maturity & Documentation	Hybrid / Corporate IT	AI / Machine Learning
Target User	Builders & Startups	CIOs & Enterprise	Data Scientists

# Industry Mapping: Who Uses What & Why

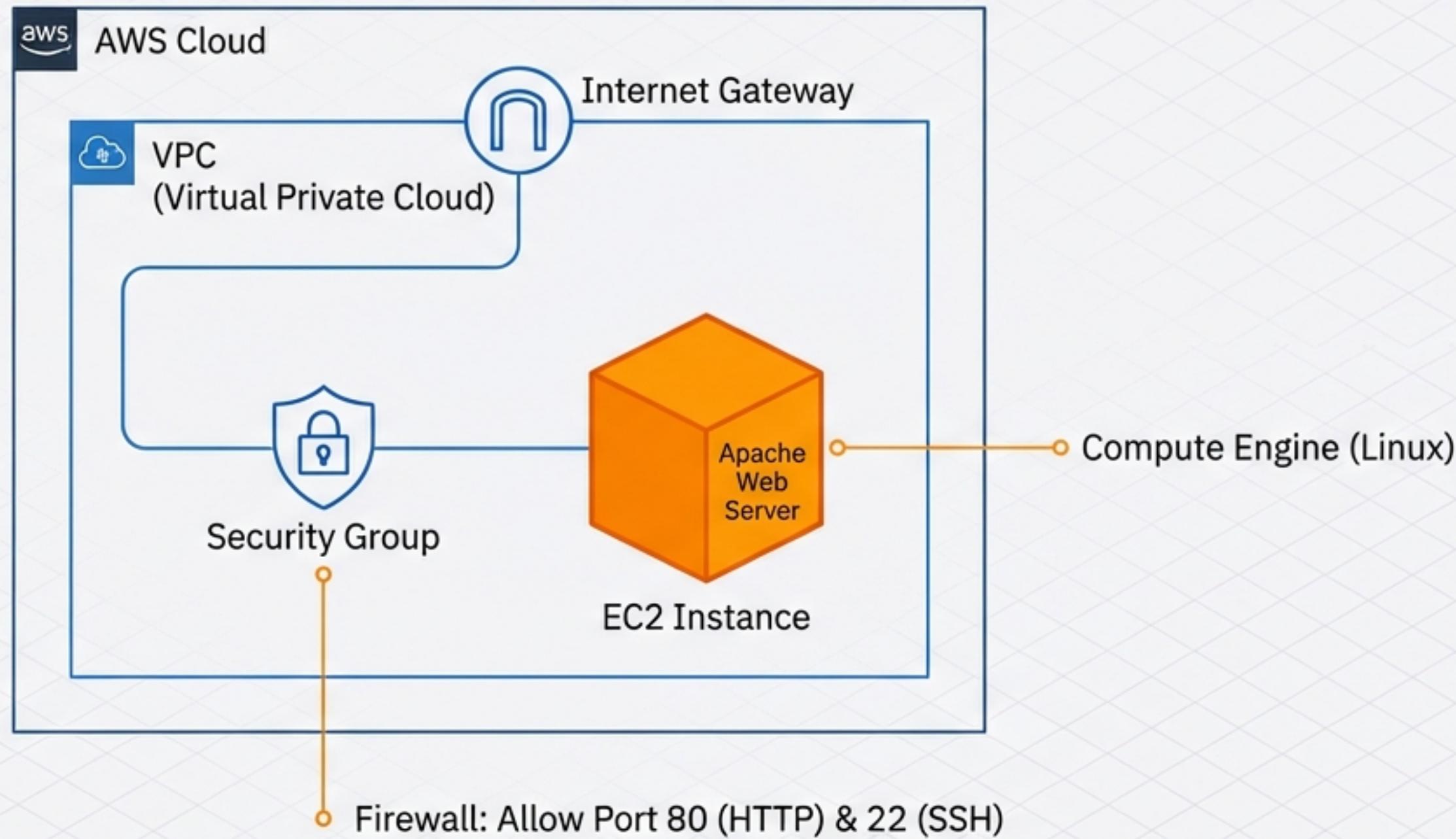


# Strategic Learning Path: Where to Start?



**ADVICE:** Master one provider first. Concepts transfer easily.

# The Lab Architecture: What We Are Building



# Deployment Workflow: Sequence of Operations

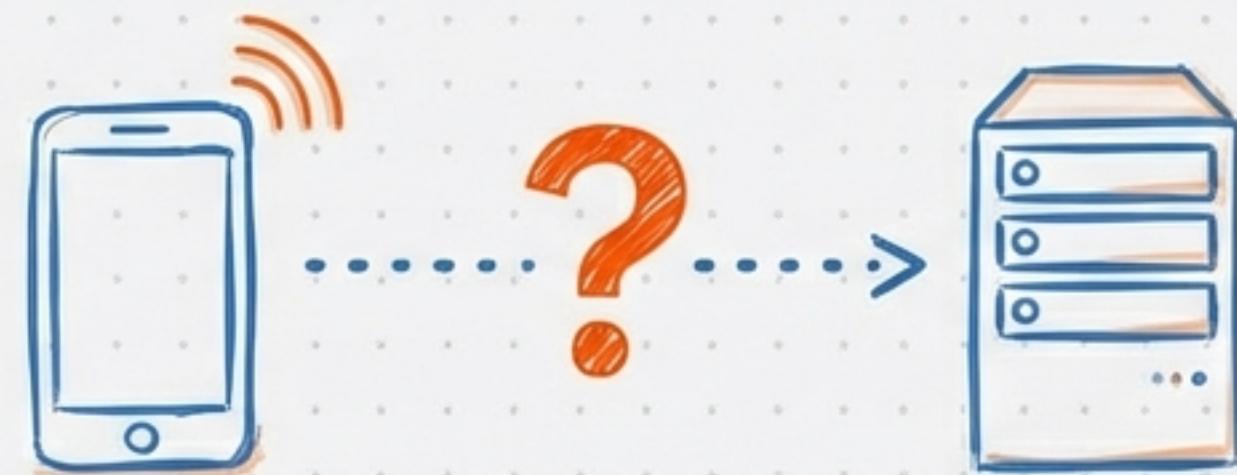


# Group Challenge: Architect for Scale

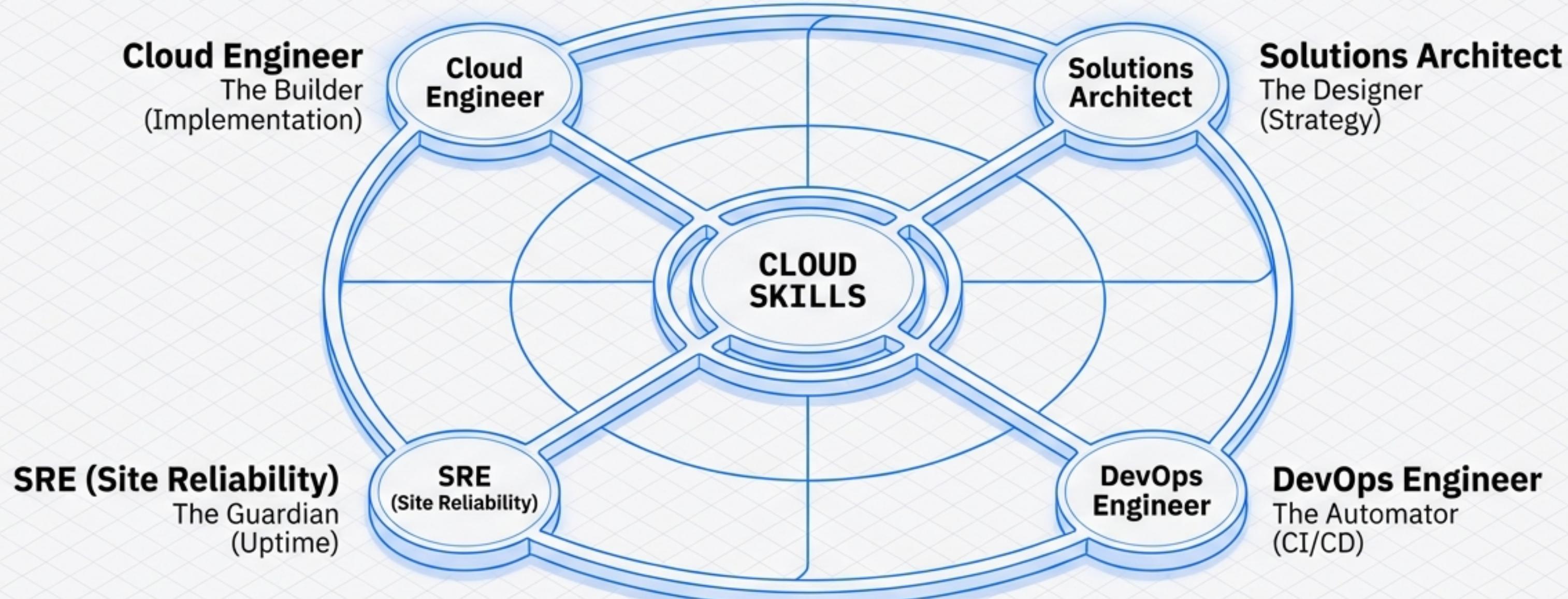
**PROMPT:** Design a fault-tolerant architecture for a viral social media app.

- Handle sudden traffic spikes (Auto-scaling)
- Store user photos (S3 Object Storage)
- Database for profiles (RDS)

**Does your design eliminate single points of failure?**

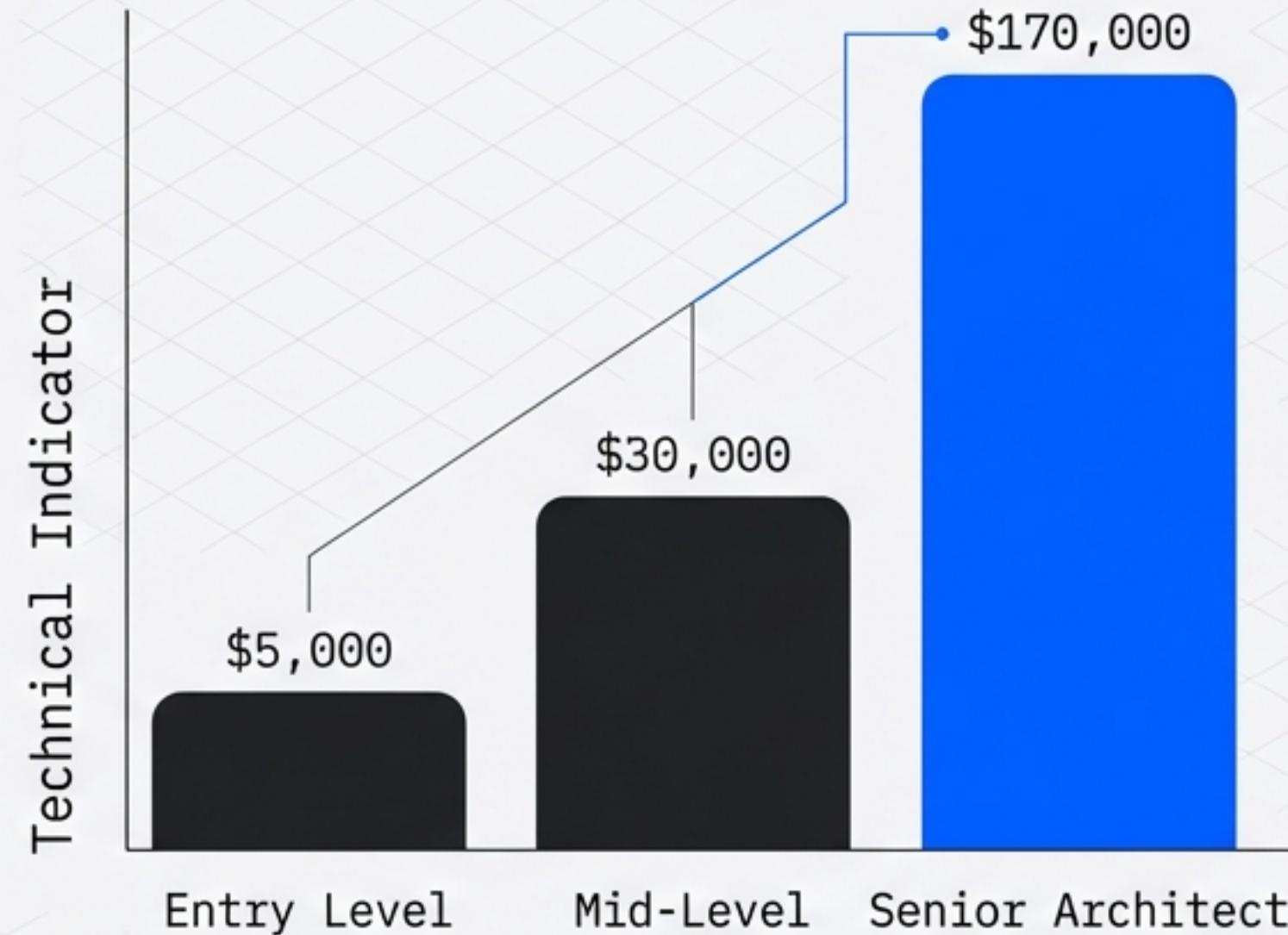


# The Cloud Career Ecosystem



# Value & Validation: Compensation and Certifications

Average Annual Salary Progression



AWS Solutions Architect  
Associate

Gold Standard

Azure Fundamentals  
AZ-900

GCP Associate  
Cloud Engineer

Insight: Certifications act as a primary filter for HR and Recruiters.

# Executive Summary & Key Takeaways



## ARCHITECTURE

Think in terms of Decoupling and Elasticity. Design for failure.



## ECONOMICS

Shift from CapEx (Fixed) to OpEx (Variable). Pay only for what you use.



## SELECTION

Choose the platform that matches your career goals (AWS=Startup, Azure=Corp).



## ACTION

Theory is useless without practice. Launch an EC2 instance today.