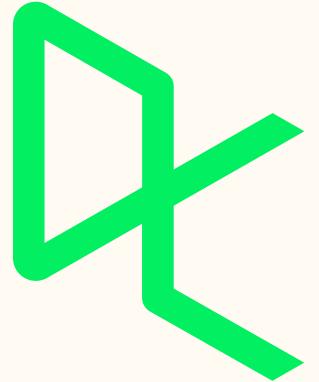


UNDERSTANDING

CLOUD

COMPUTING



Sara Billen

*Senior Data Analyst,
DataCamp*



Understanding Cloud Computing
Chapter 1, Lesson 1

**Let's start with a
FUN FACT!**





2024

AWS > \$100 billion
in revenue

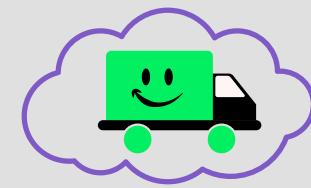
Operating Income
= \$40 billion

**More than 60% of
Amazon's total
revenue!**

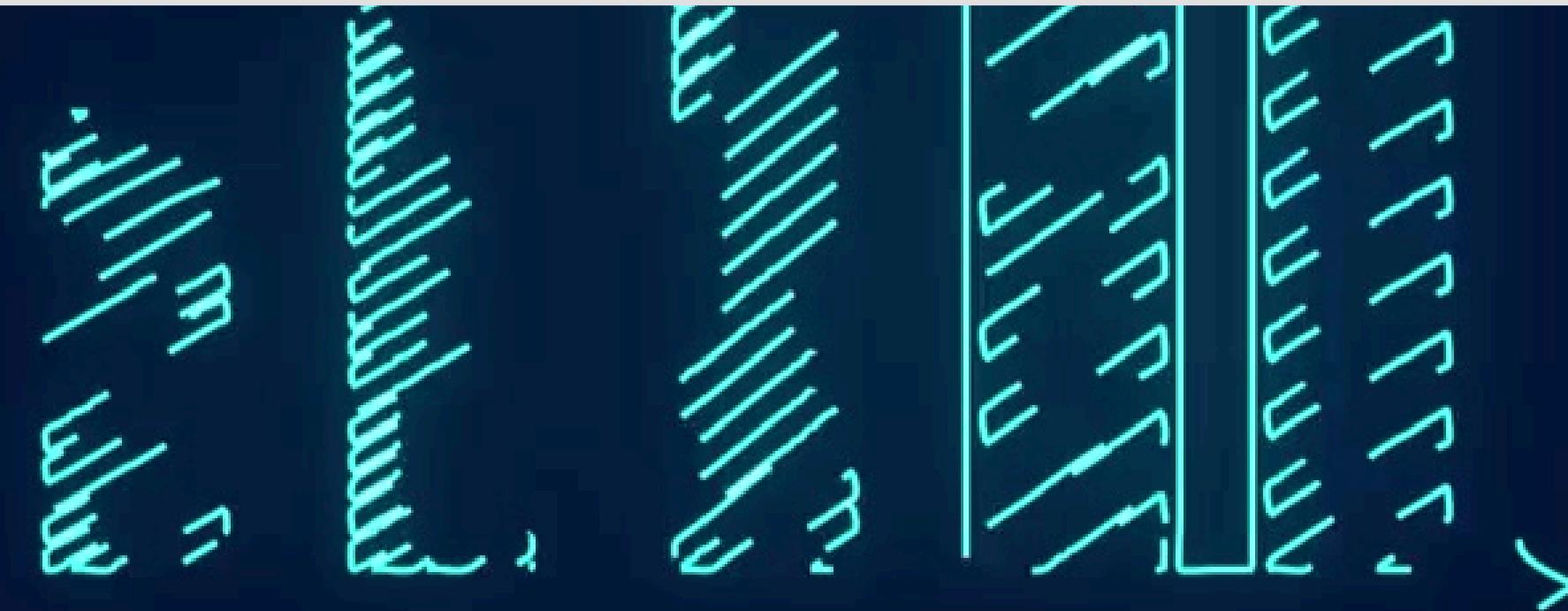


WHAT?!





Crazy right?!

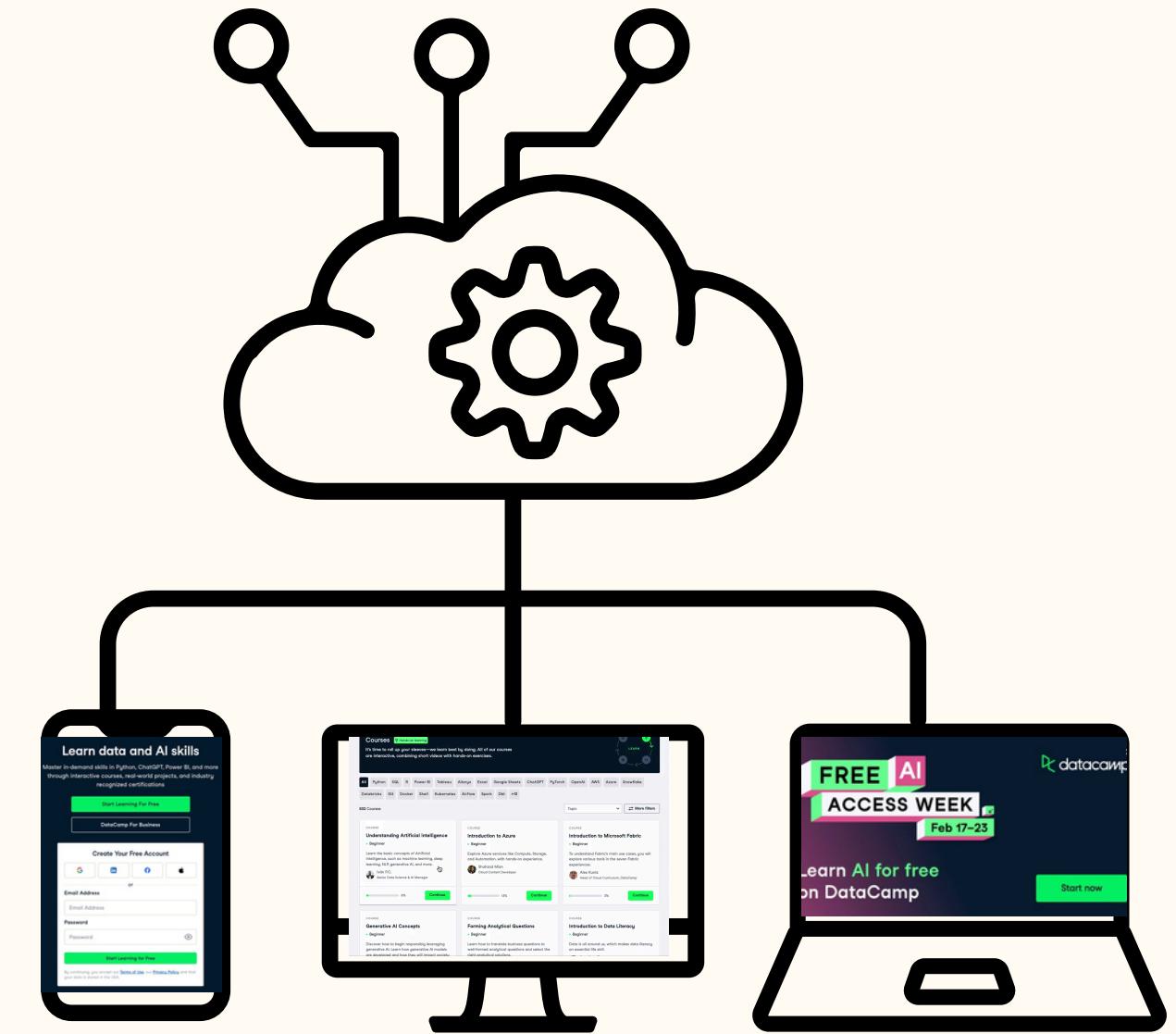


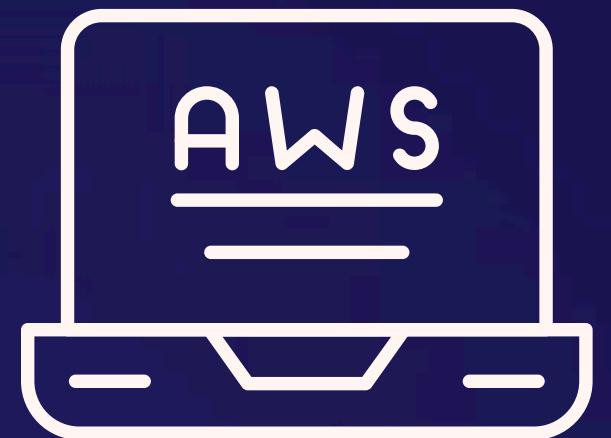
**What is
Cloud
Computing?**



Technology Services

- ✓ Computing power
 - ✓ Storage
 - ✓ Databases
 - ✓ Networking
- ✓ Over the internet
- ✓ Pay-as-you-go pricing





**How does it
ACTUALLY
WORK!?**



Progress

My Library

Leaderboard

Assignments

RN

Tracks

Courses

Practice

FREE AI
ACCESS WEEK

Real World Projects

Code Alongs

Competitions

Popular Topics NEW

Getting Started (4/4)



Hey, Maggie!

Portfolio 30% complete >

Review 2

Daily Streak 0

You're enrolled in the [Associate Data Scientist in Python track](#).

LEARN



[Understanding Artificial Intelligence](#) >

8% 2 hours to go

Keep Making Progress

Our AI courses are FREE until Feb 23!

Feb 17–23



[Introduction to data](#)



[Investigating Netflix Movies](#)



[My Assignments](#)

[See All](#)



[Artificial Intelligence \(AI\) Strategy](#)

Course



26 days late

MISSED



[Pick up where you left off](#)

[See All in My Library](#)



COURSE

[Understanding Artificial Intelligence](#)

8%

Practice

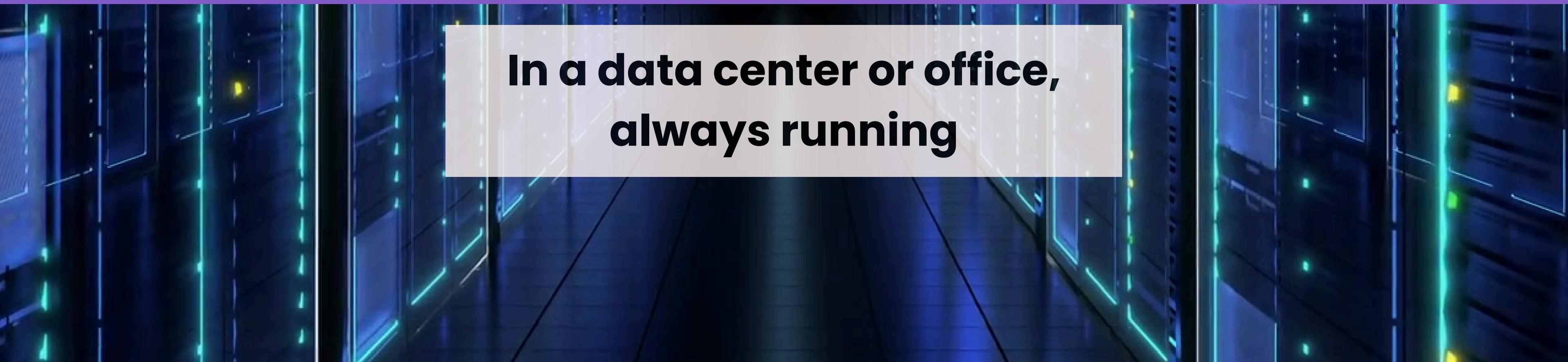
Continue







Physical Server



**In a data center or office,
always running**

Physical Server Challenges

Traffic increases = more servers

Buying or renting = expensive

Dip in traffic = excess capacity





Cloud Computing



Cloud Computing

No owning physical servers

**Website runs on cloud
servers**

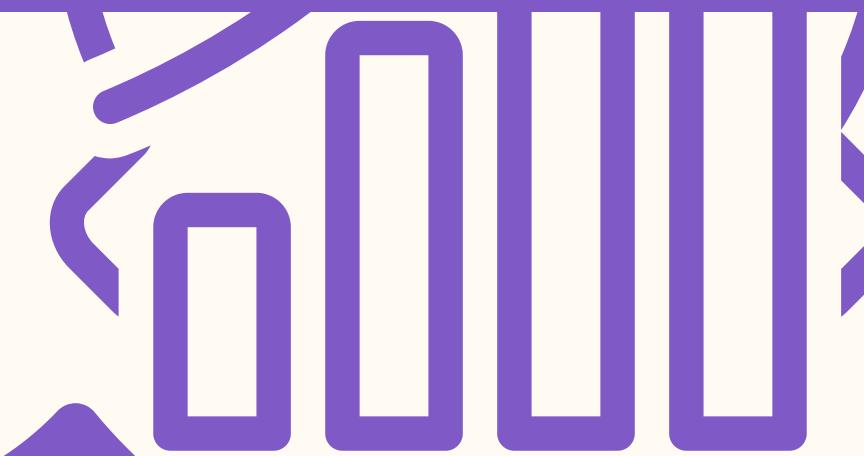


Traffic
SURGES?!





Increase computing power in seconds



Traffic
SLOWS?!





Scale back and pay less



which is
BETTER?



Cloud



Flexible



Scalable



Quick to set-up

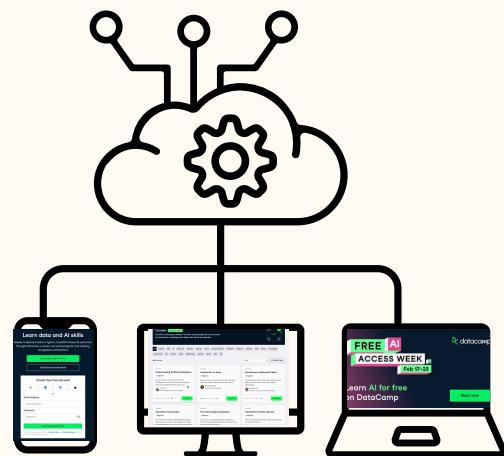


Security



Cost

On-premise



Cloud



Flexible



Scalable



Quick to set-up

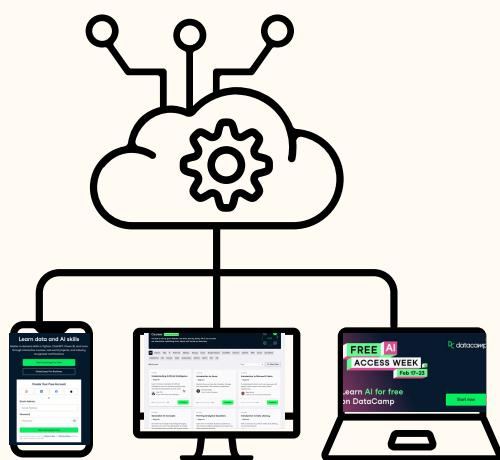


Security



Cost

On-premise

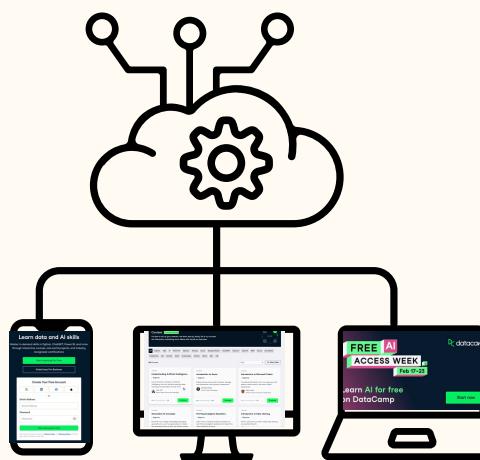


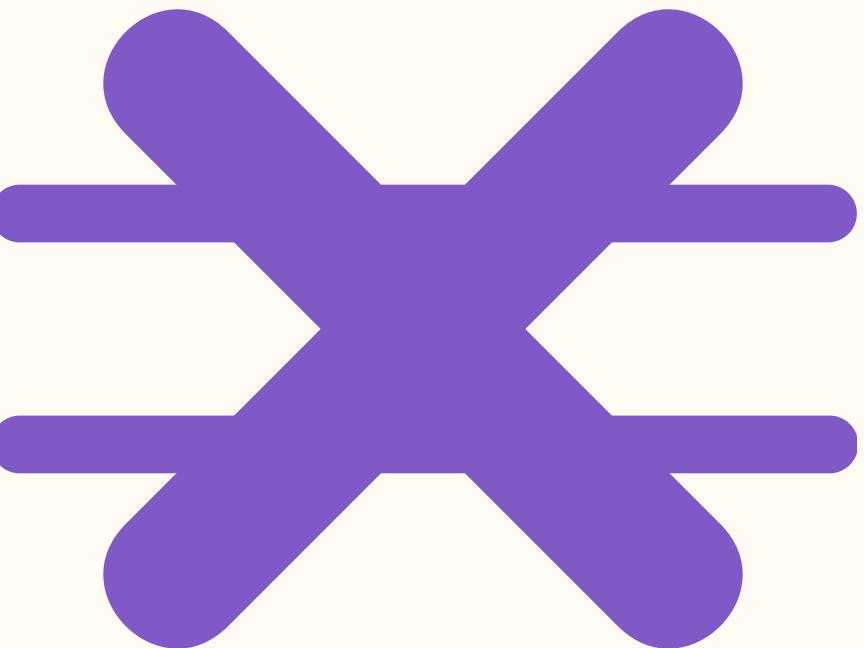
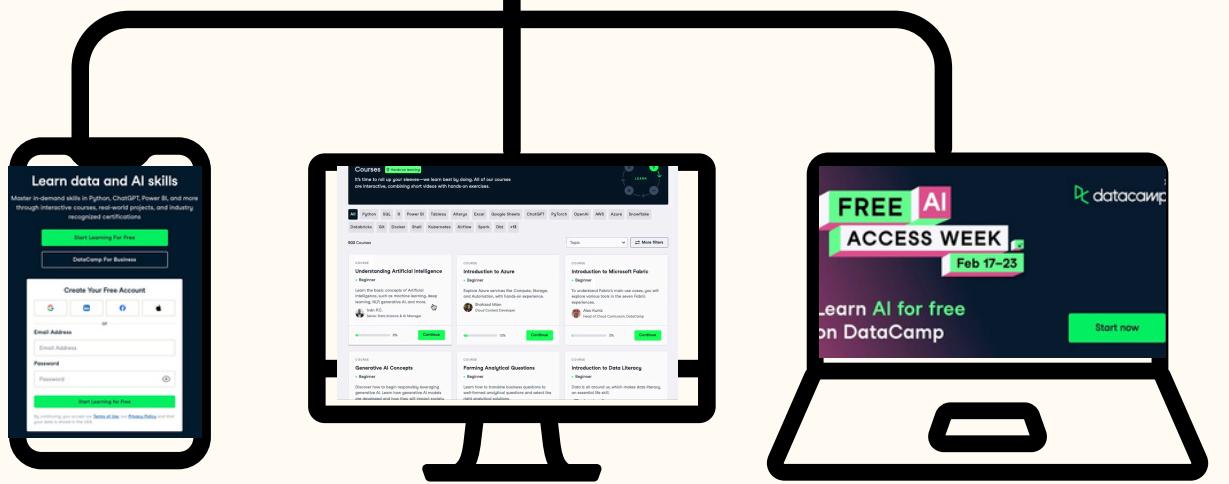
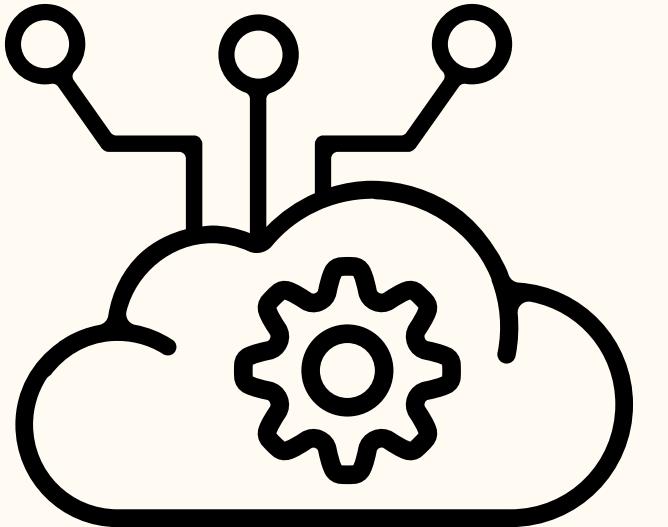
Cloud

- 😊 Flexible
- 😊 Scalable
- 😊 Quick to set-up
- 😐 Security
- 😐 Cost

On-premise

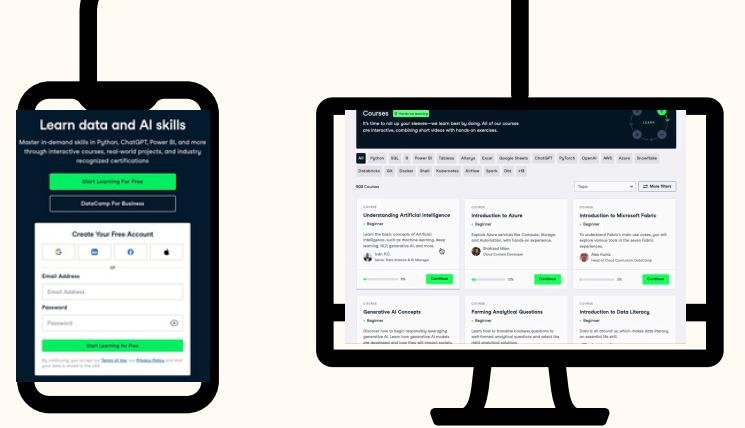
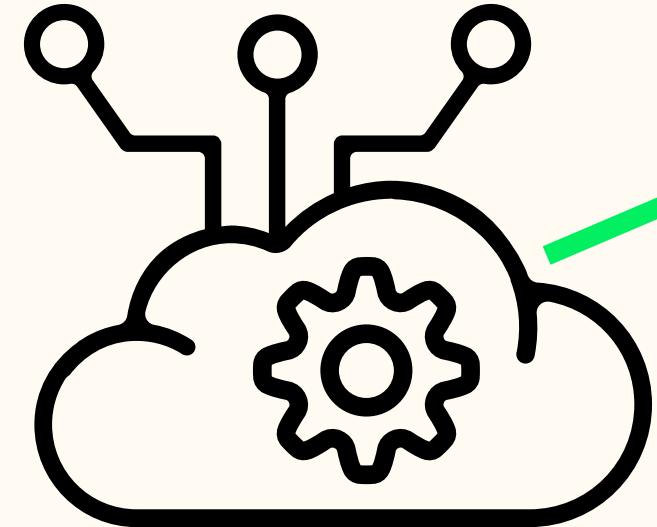
- 😊 More control
- 😊 Security
- 😢 Scalable
- 😢 Cost



A screenshot of the DataCamp website interface. At the top, there are several navigation tabs: All, Python, SQL, R, Power BI, Tableau, Alteryx, Excel, Google Sheets, ChatGPT, PyTorch, and OpenAI. Below these are more specific tabs: AWS, Azure, Snowflake, Databricks, Git, Docker, Shell, Kubernetes, Airflow, and '+15'. A search bar labeled 'Topic' and a 'More filters' button are also present. The main content area displays a grid of course cards. The first two cards are partially visible at the top. Below them are six cards arranged in two columns of three. Each card includes a thumbnail, the course title, a level indicator (Beginner), a brief description, the instructor's name and profile picture, and a 'Continue' button. The courses shown are: 'Senior Data Science & AI Manager' (8% completion), 'Generative AI Concepts' (13% completion), 'Introduction to Microsoft Fabric' (3% completion), 'Generative AI Concepts' (5% completion), 'Forming Analytical Questions' (3% completion), 'Introduction to Data Literacy' (8% completion), 'Introduction to ChatGPT' (3% completion), and 'Introduction to Julia' (8% completion).

Course Title	Instructor	Completion (%)	Action
Senior Data Science & AI Manager	Alex Kuntz	8%	Continue
Generative AI Concepts	Daniel Tedesco	13%	Continue
Introduction to Microsoft Fabric	Alex Kuntz	3%	Continue
Generative AI Concepts	Daniel Tedesco	5%	Continue
Forming Analytical Questions	Konstantinos Kattidis	3%	Continue
Introduction to Data Literacy	Anneleen Rummens	8%	Continue
Introduction to ChatGPT	James Chapman	3%	Continue
Introduction to Julia	James Fulton	8%	Continue





Data storage

Backups

AI models

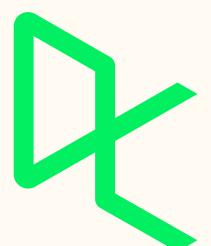
Streaming services

...and more



Let's
PRACTICE!

Understanding Cloud Computing



UNDERSTANDING CLOUD COMPUTING

CHAPTER 1, LESSON 2



Sara Billen
*Senior Data Analyst,
DataCamp*



Cloud Services

Compute

Storage

Databases

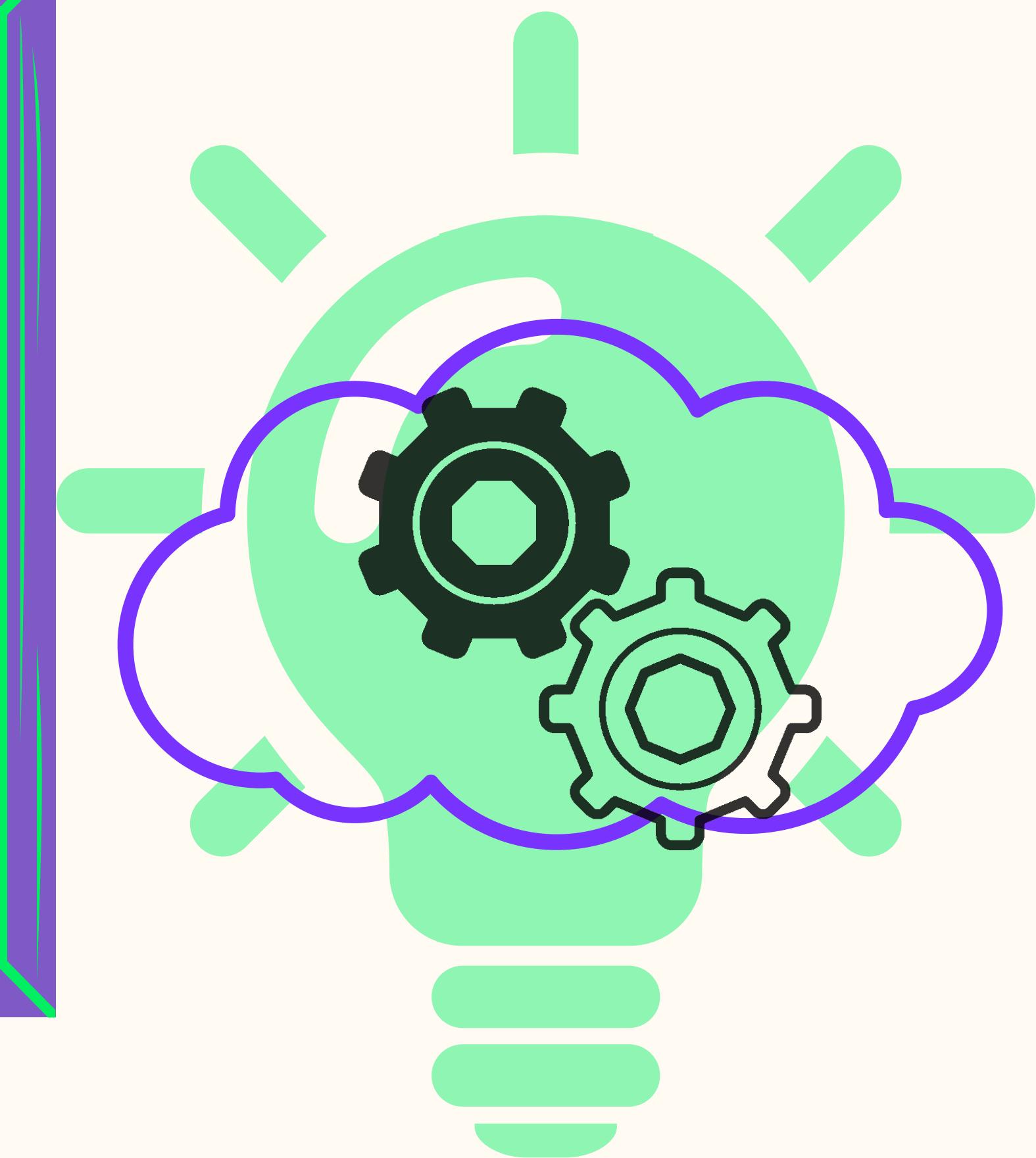
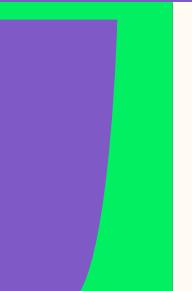


Compute = brain

Storage saves files and data

Databases store data

**Combining: business can build
powerful cloud solutions**



Cloud Computing Advantages

Cost

Scalability

Speed

Reliability

Performance

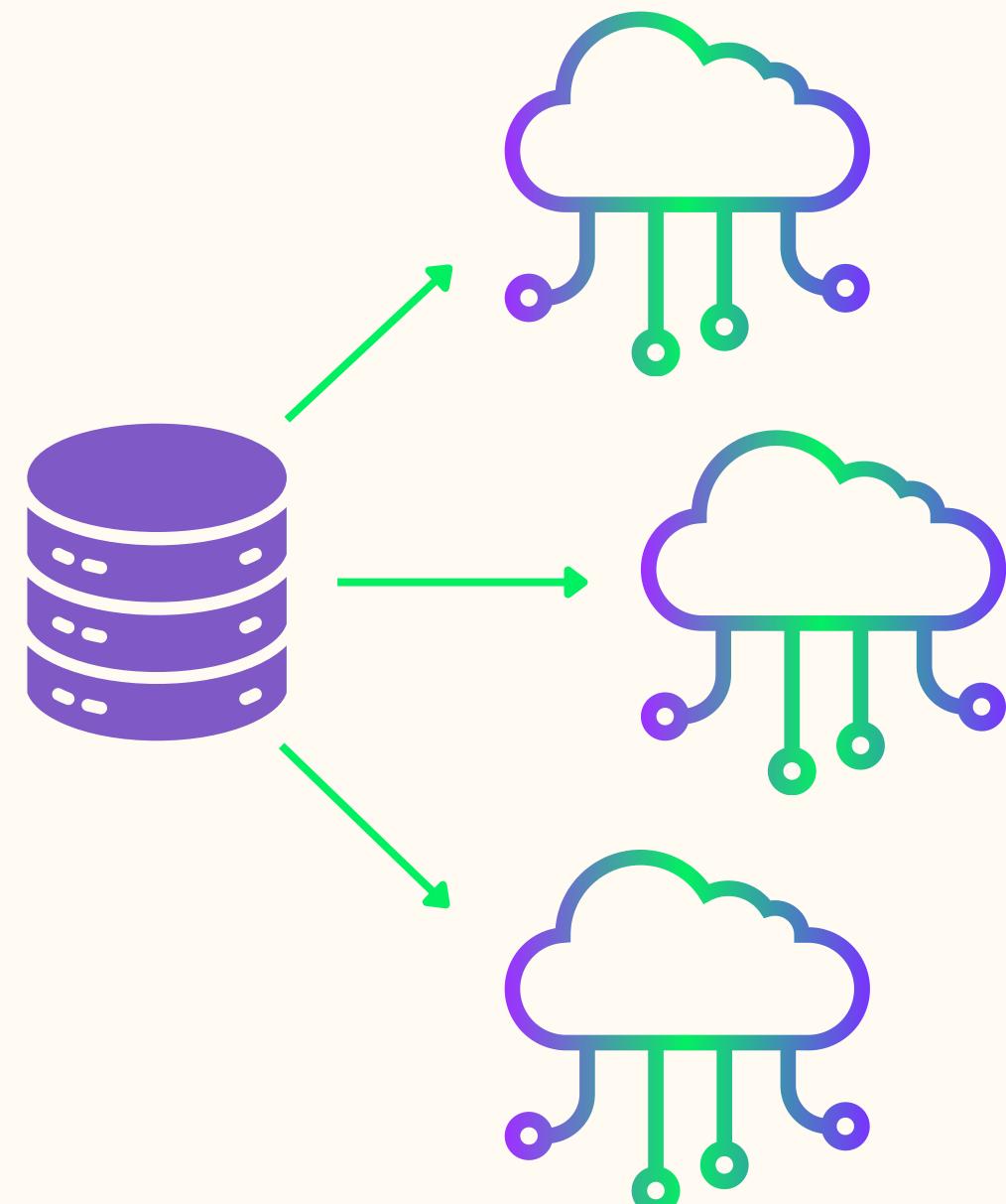
Security





Virtualization





Virtualization

Better resource efficiency

Lower costs

Easier management



Scalability

Adjust resources based
on demand



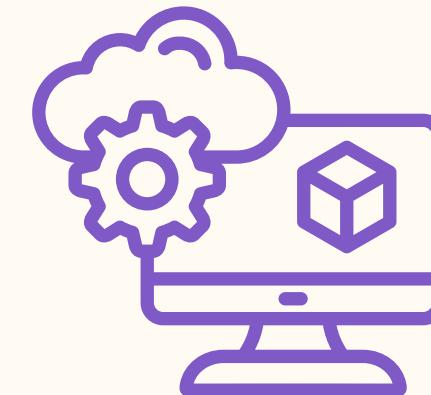
Vertical Scaling

Upgrades an existing machines power (RAM, CPU)



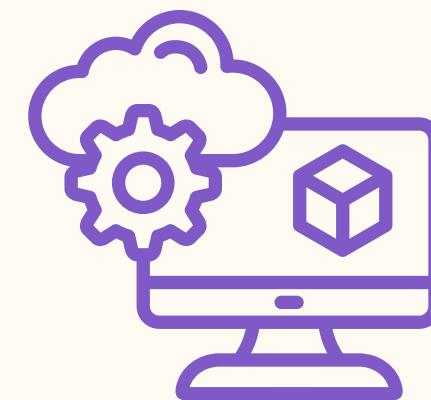
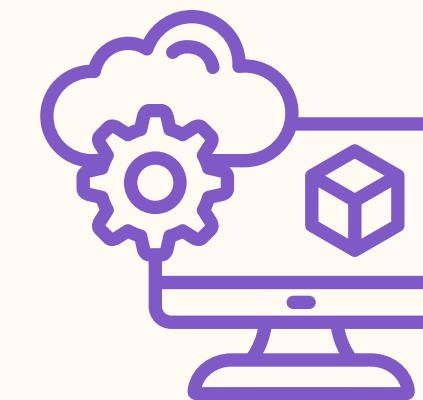
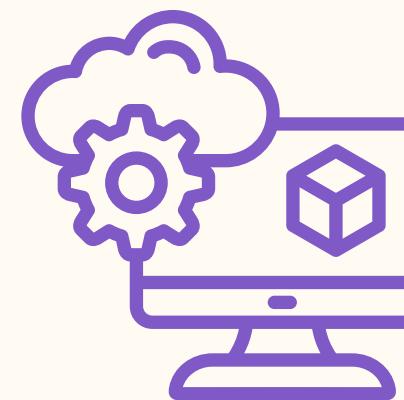
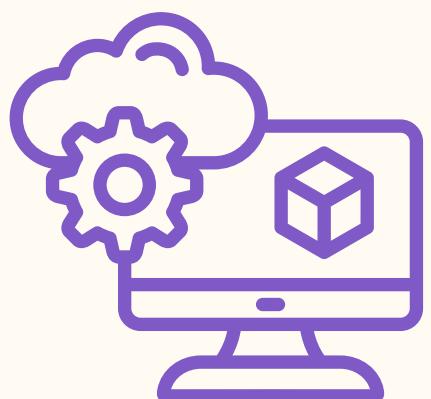
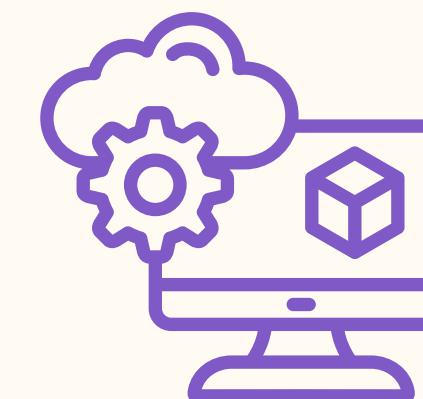
Vertical Scaling

Upgrades an existing machines power (RAM, CPU)



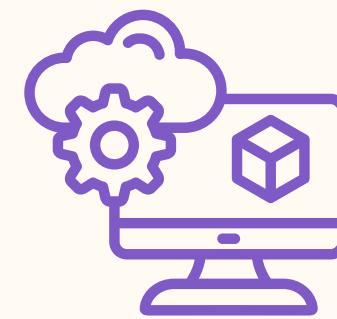
Horizontal Scaling

Adds more machines to share the workload



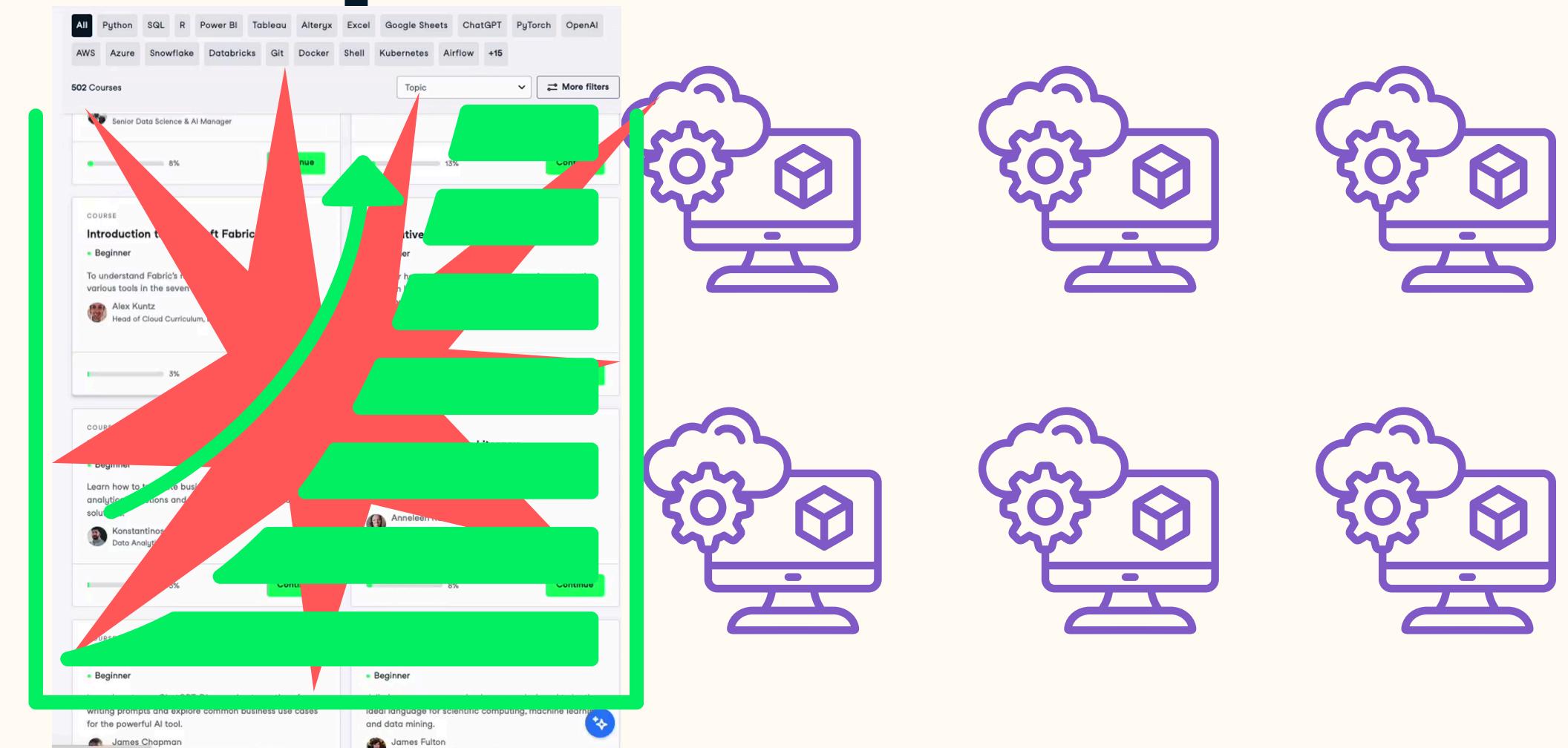
Vertical Scaling

Upgrades an existing machines power (RAM, CPU)



Horizontal Scaling

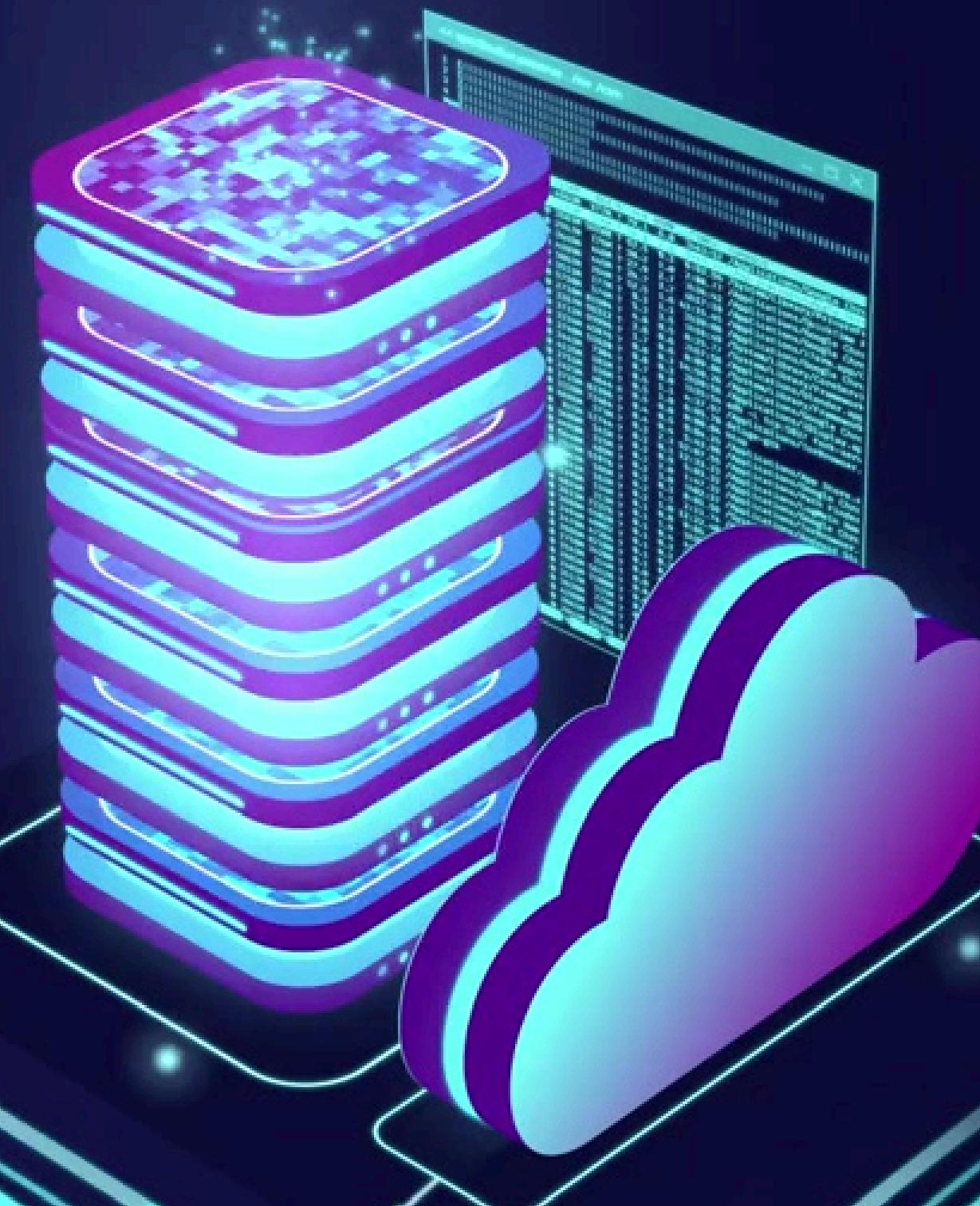
Adds more machines to share the workload



**Pay-as-you-go
pricing**

=

**Only pay for what
you need**



Pay-as-you-go pricing

- ✓ Scale up when you need to
- ✓ Reduce when you need to

**For most, flexibility
wins**

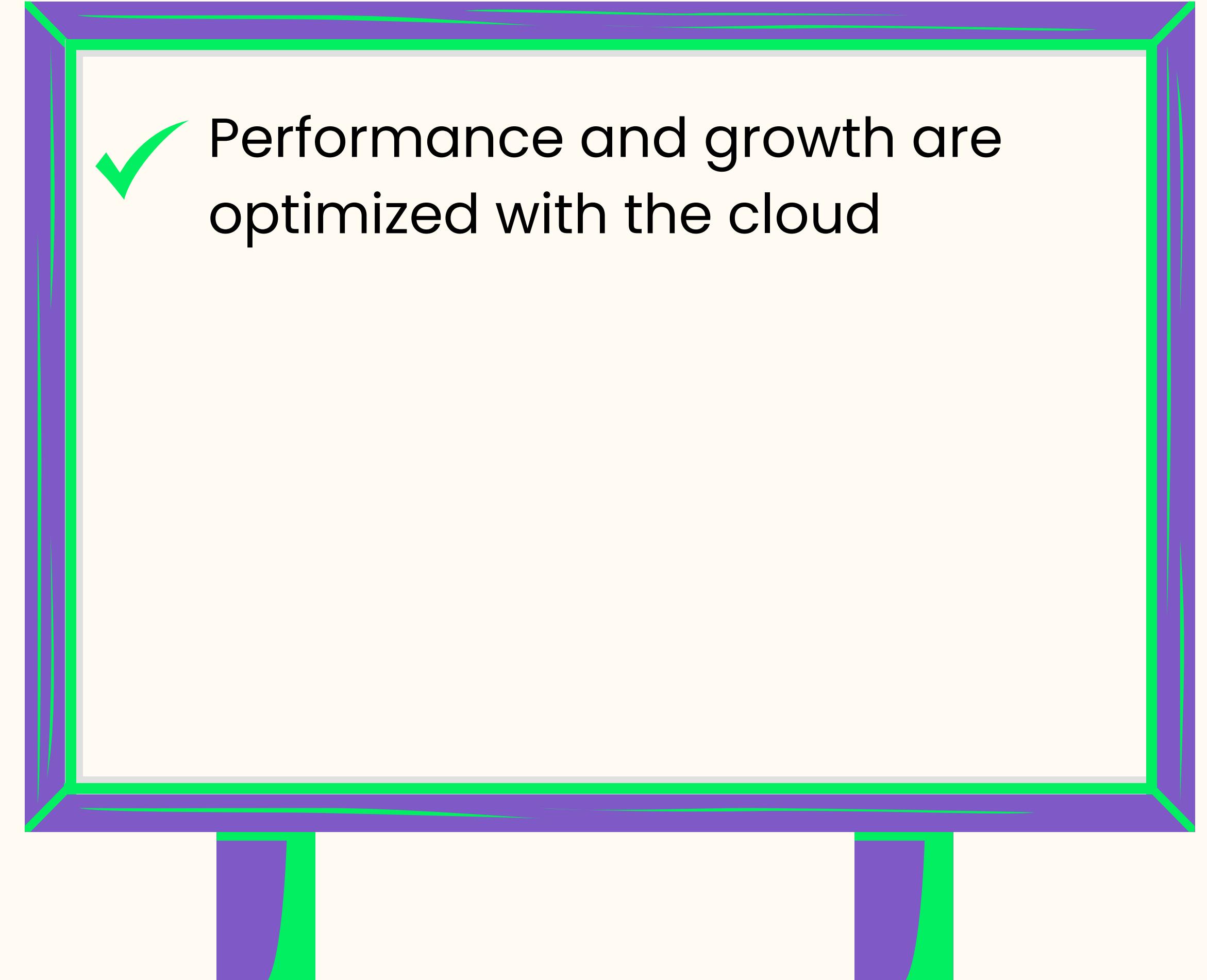


Speed

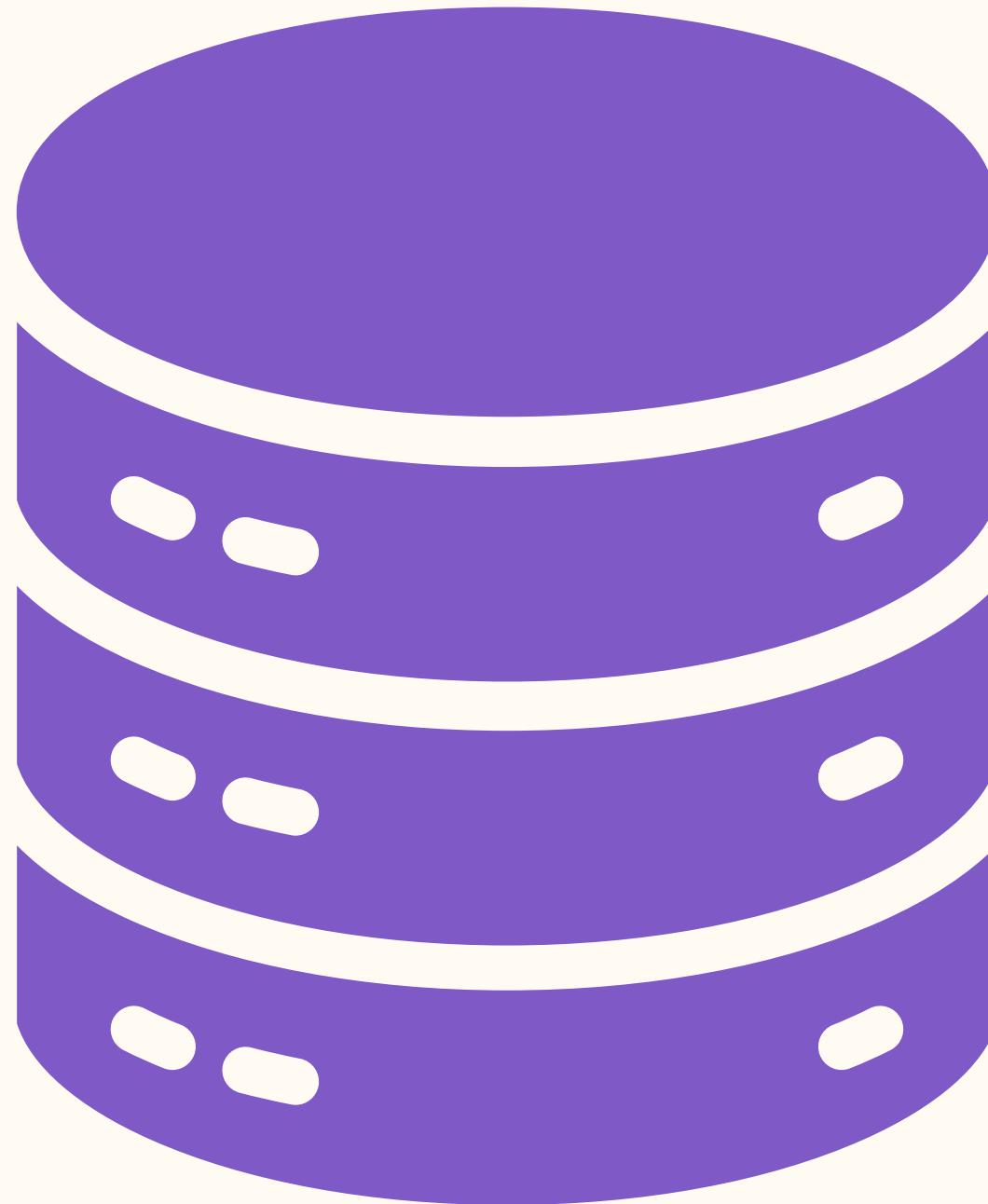
On demand resources
enables quick launch of
services and applications



Speed



Speed



- ✓ Performance and growth are optimized with the cloud
- ✗ On-premise can't compete with constant cloud upgrades





Expand globally

Quickly deploy services
and resources



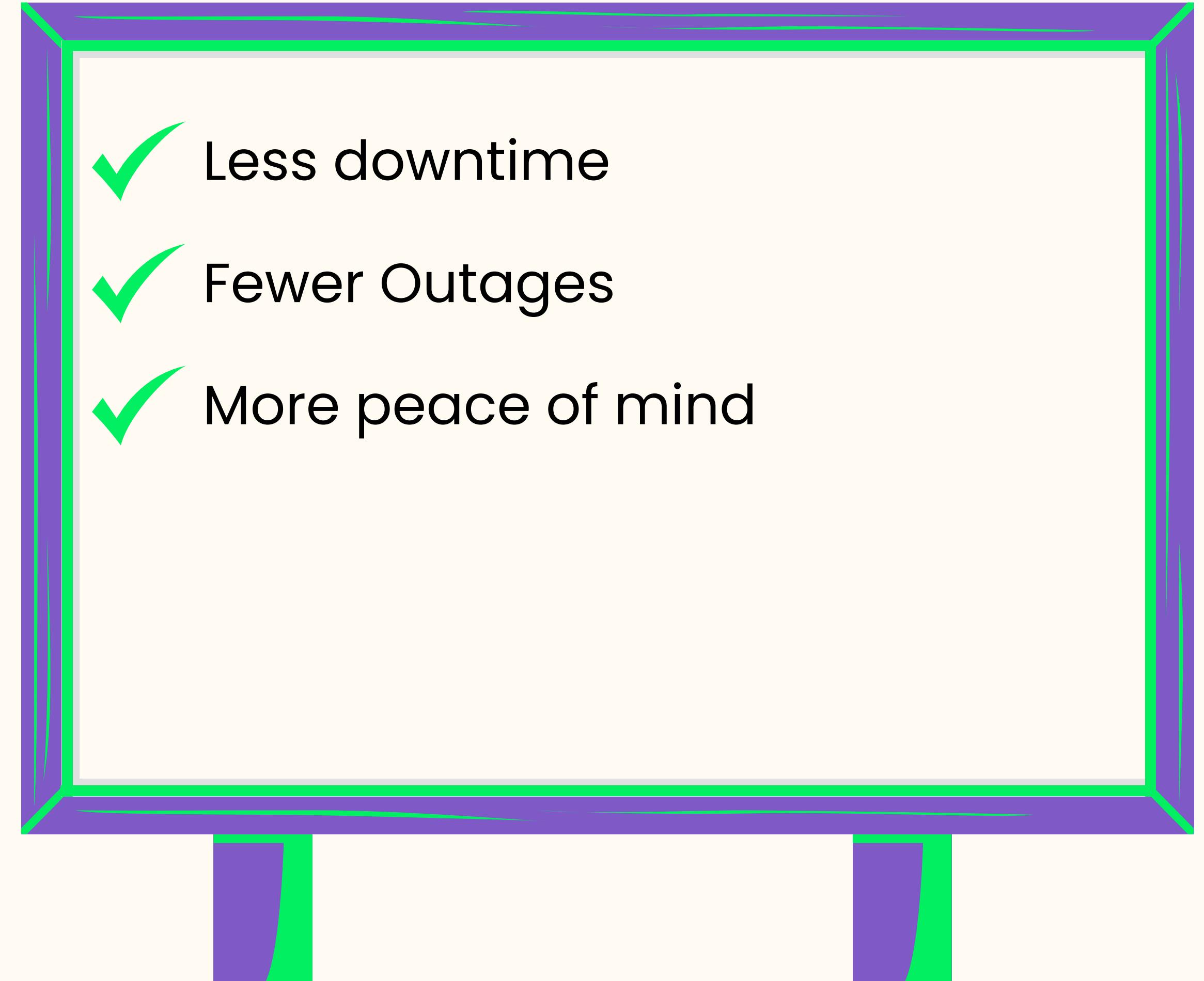
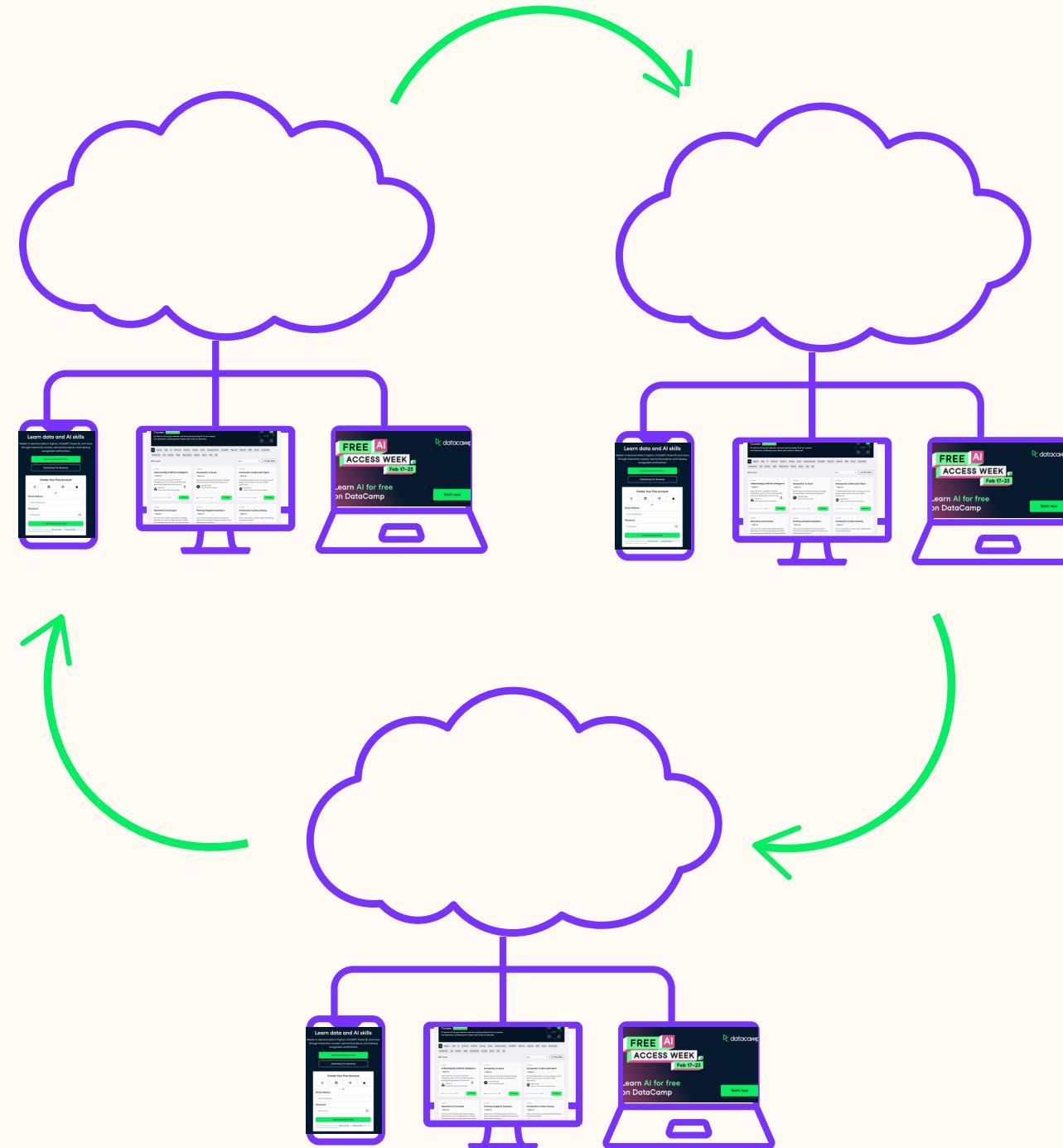
Reliability



Reliability



Reliability





Security



Security

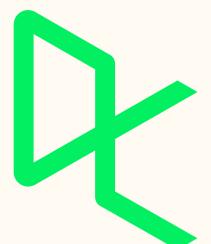
- ✓ Very important
- ✓ Some industries have strict regulations

**Many cloud providers now
meet these standards!**



Let's
PRACTICE!

Understanding Cloud Computing



UNDERSTANDING CLOUD COMPUTING

CHAPTER 1, LESSON 3



Sara Billen
*Senior Data Analyst,
DataCamp*



Cloud Service Models

Infrastructure as a Service
(IaaS)

Platform as a Service
(PaaS)

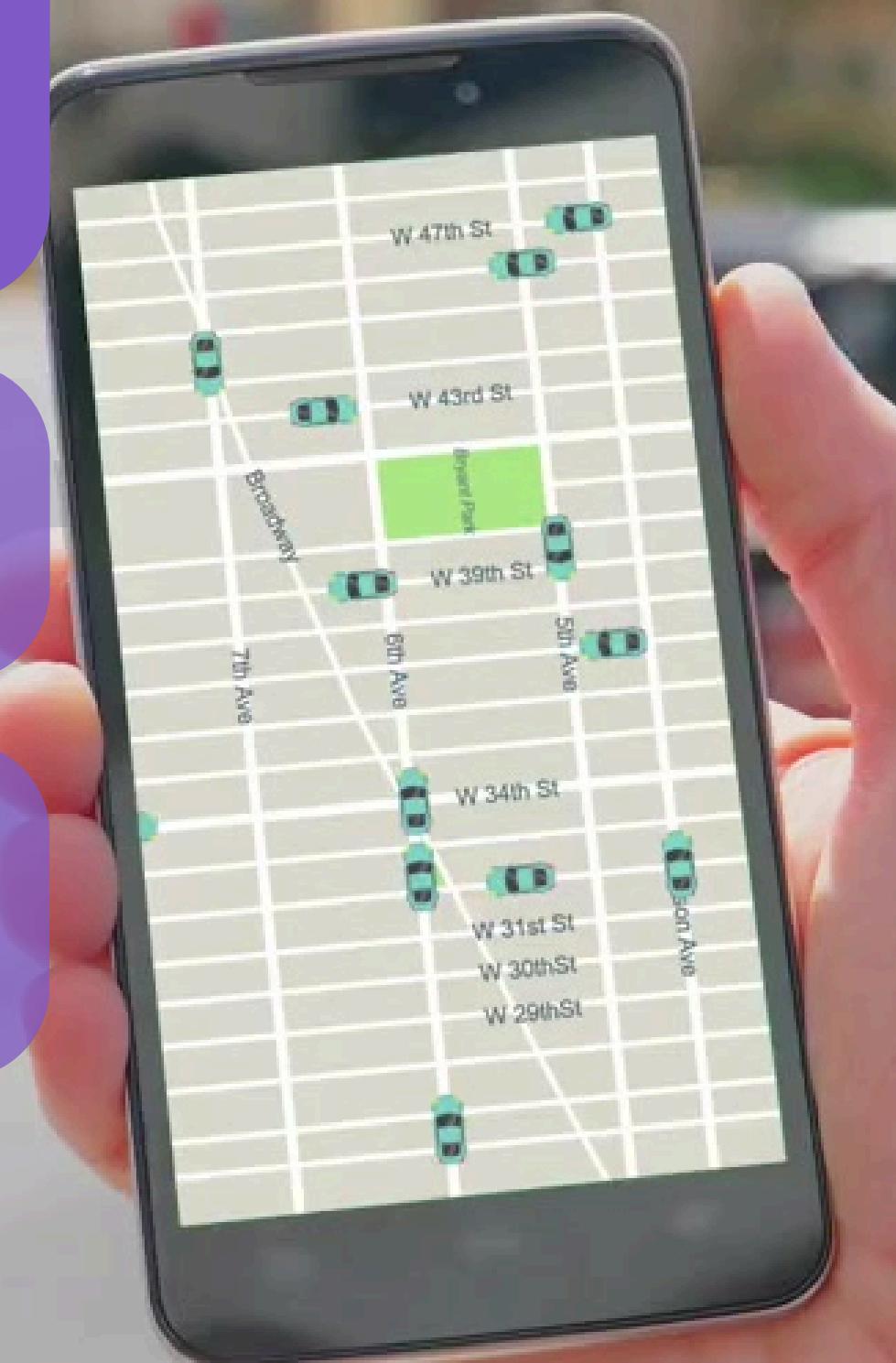
Software as a Service
(SaaS)



**Companies rent
cloud space**

No maintenance

Pay for what you use



Owning

Car

Maintenance

Insurance

Cleaning

Parking

Fuel

Driver

Route

You
Manage

Vendor
Manages



Car Owned

Owning

Car

Maintenance

Insurance

Cleaning

Parking

Fuel

Driver

Route

On Premise

Networking

Storage

Servers

Virtualization

o/s

Middleware

Runtime

Data

Applications

You
Manage

Vendor
Manages



Car Owned

Infrastructure as a Service (IaaS)

- ✓ Networking
- ✓ Storage
- ✓ Servers
- ✓ **Virtualization**



Car Rented



Renting

Car

Maintenance

Insurance

Cleaning

Parking

Fuel

Driver

Route

IaaS

Networking

Storage

Servers

Virtualization

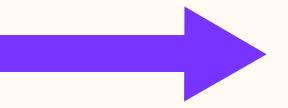
o/s

Middleware

Runtime

Data

Applications



You
Manage

Vendor
Manages



Platform as a Service (PaaS)

- ✓ Networking
- ✓ Storage
- ✓ Servers
- ✓ Virtualization
- ✓ o/S
- ✓ **Middleware**
- ✓ **Runtime**



Ride Sharing



Ride Sharing

Car

Maintenance

Insurance

Cleaning

Parking

Fuel

Driver

Route

PaaS

Networking

Storage

Servers

Virtualization

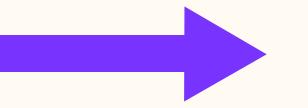
o/s

Middleware

Runtime

Data

Applications



You
Manage

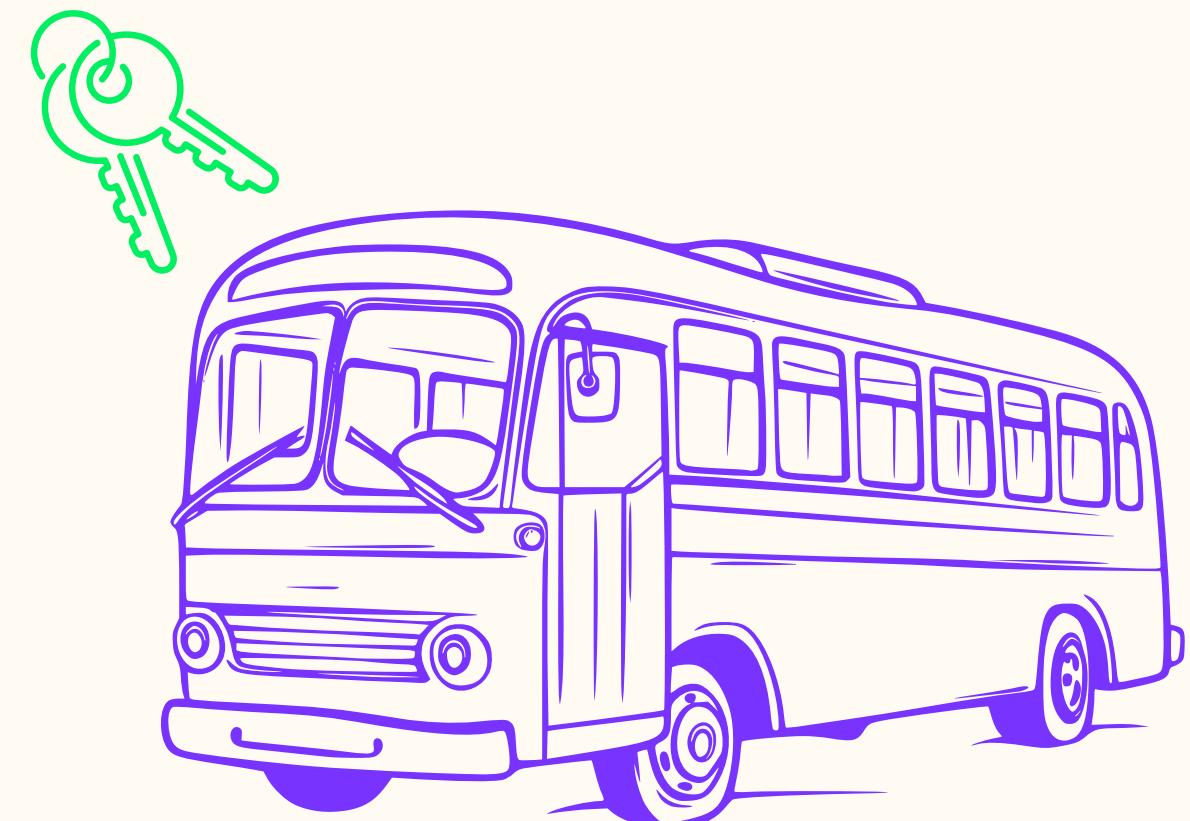
Vendor
Manages



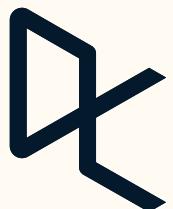
Ride Sharing

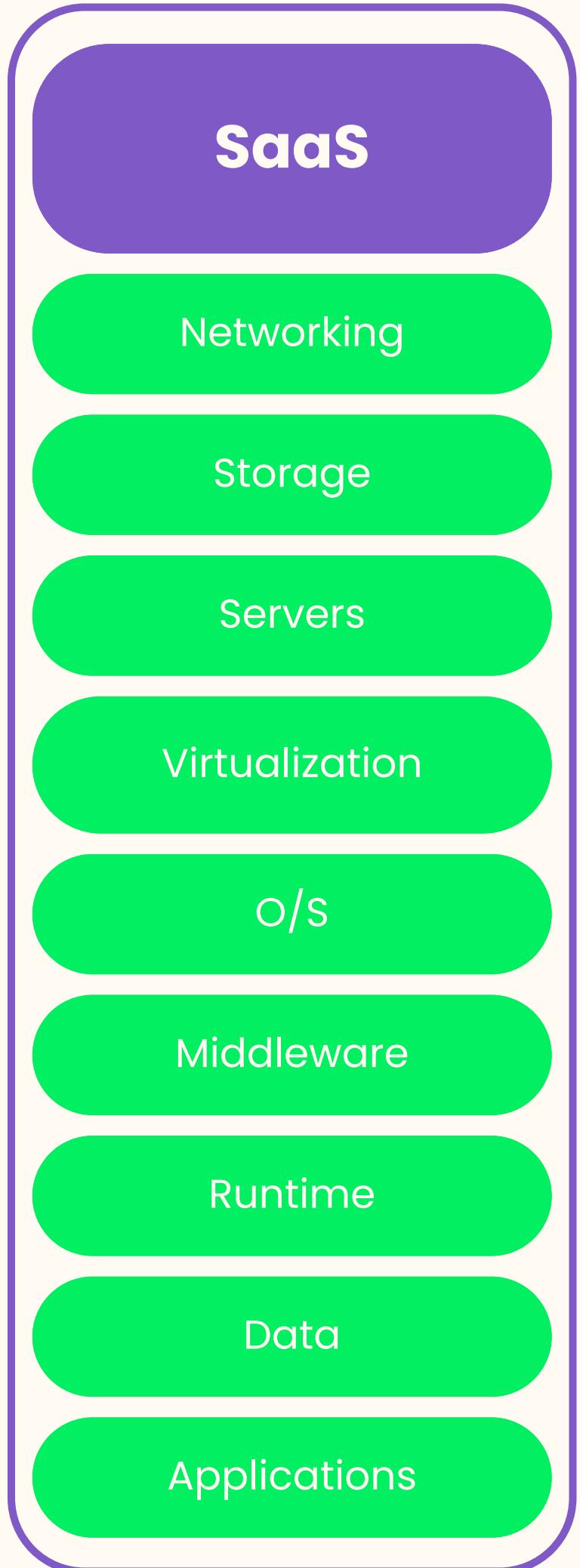
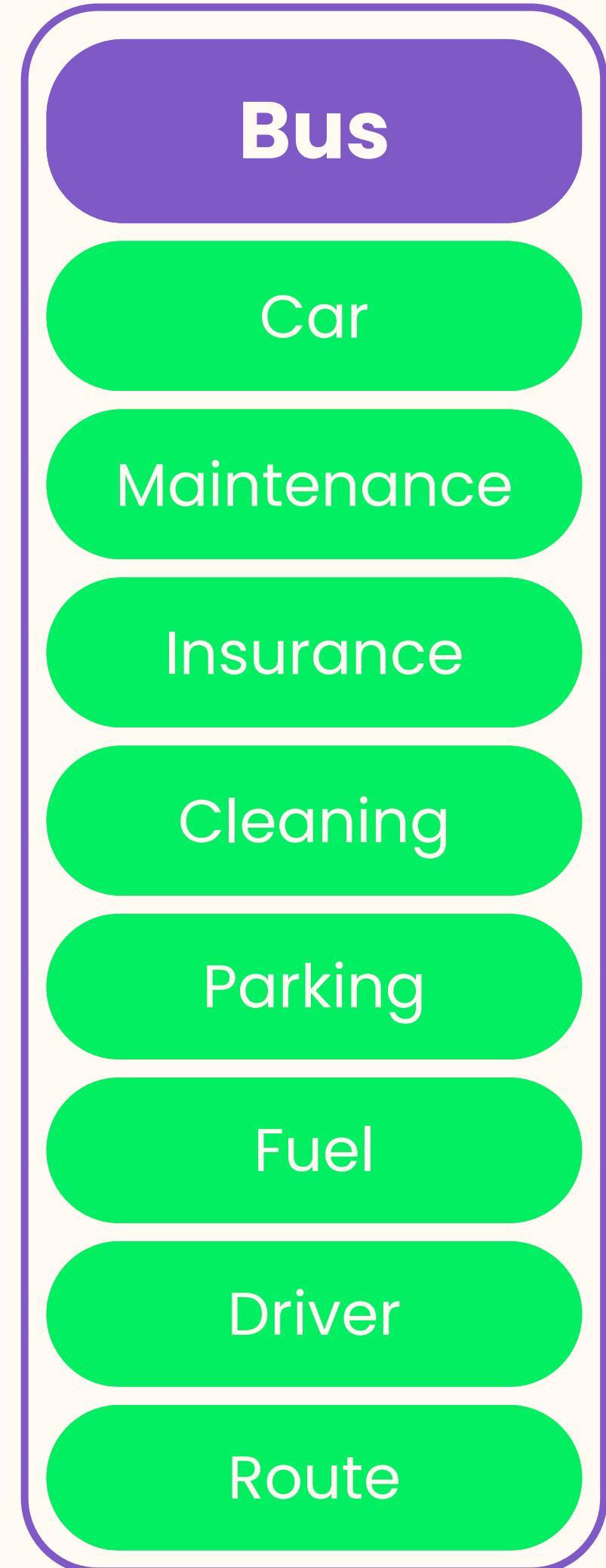
Software as a Service (SaaS)

- | | |
|------------------|----------------|
| ✓ Networking | ✓ Middleware |
| ✓ Storage | ✓ Runtime |
| ✓ Servers | ✓ Data |
| ✓ Virtualization | ✓ Applications |
| ✓ o/s | |



Taking the bus





Taking the bus

Cloud Service Models Features

You
Manage

Vendor
Manages

On Premise

Networking

Storage

Servers

Virtualization

o/s

Middleware

Runtime

Data

Applications

IaaS

Networking

Storage

Servers

Virtualization

o/s

Middleware

Runtime

Data

Applications

PaaS

Networking

Storage

Servers

Virtualization

o/s

Middleware

Runtime

Data

Applications

SaaS

Networking

Storage

Servers

Virtualization

o/s

Middleware

Runtime

Data

Applications

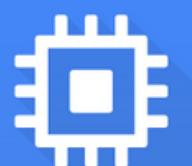
Infrastructure as a Service (IaaS)

Scalable, cloud-based infrastructure

Users: System Admins



Amazon
EC2



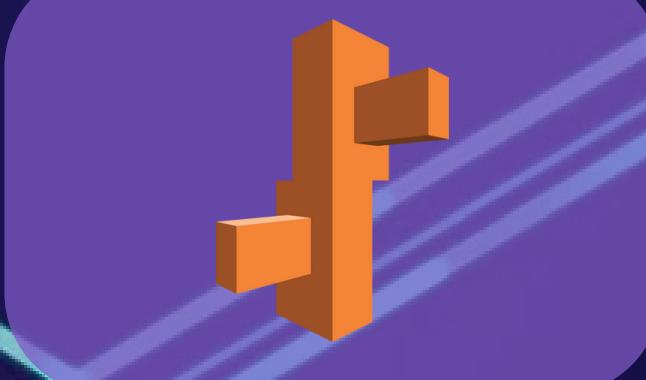
Processor



Platform as a Service (PaaS)

Full development environment

Users: Developers



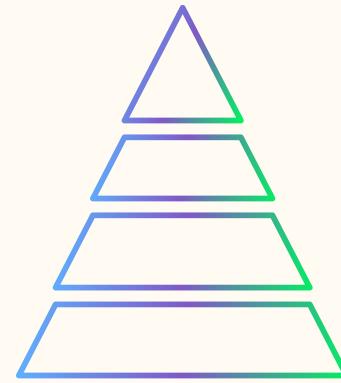
Software as a Service (SaaS)

Software available online,
no installation

Users: everyone, end
users



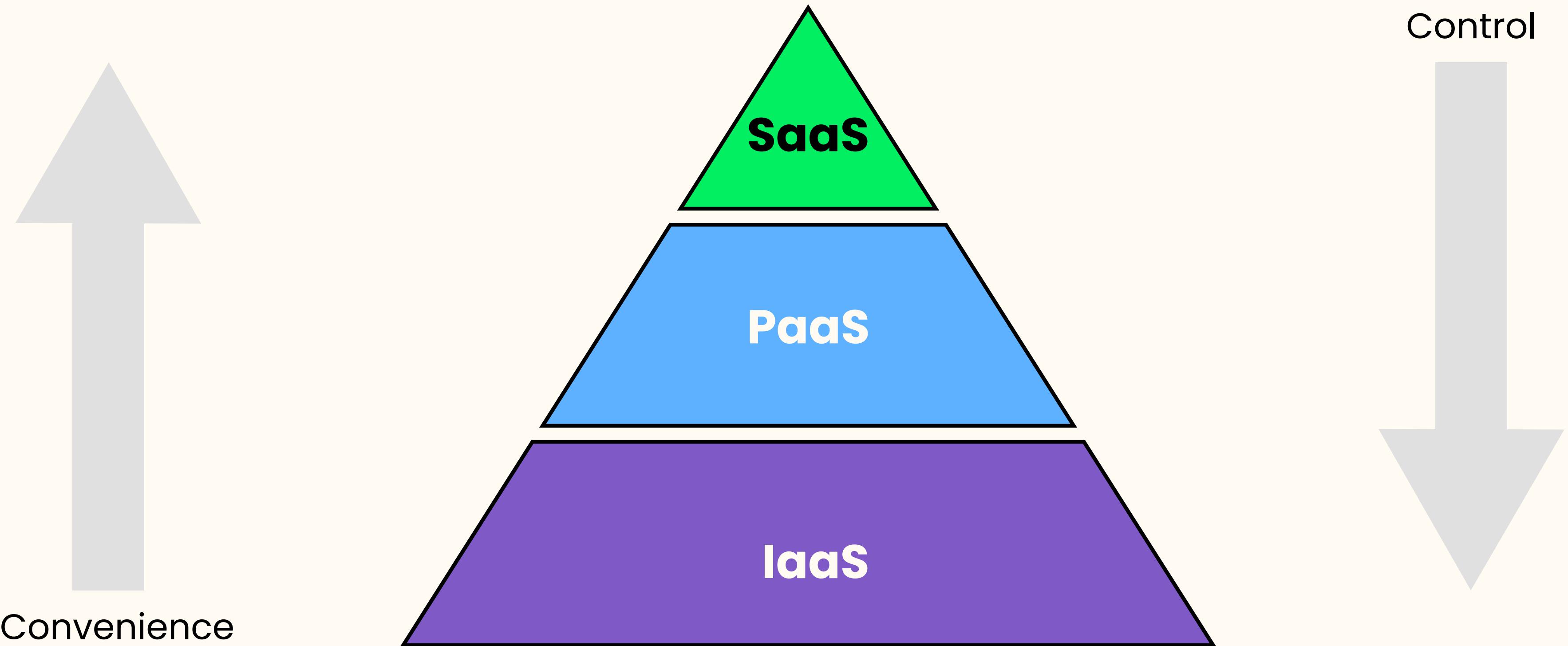
Cloud Service Models



	IaaS Infrastructure as a Service	PaaS Platform as a Service	SaaS Software as a Service
Definition	Cloud-based alternative to on-premise infrastructure	Hardware and software tools used over the internet to develop applications	Software available over the internet, usually for a monthly subscription
Advantages	Scalable alternative to on-premise infrastructure	Developers don't need to start from scratch when creating applications	No need to install software on your computer
Users	System Admins	Developers	End Customers
Examples	 Amazon EC2 	 	  

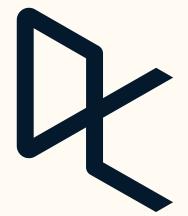


Cloud Service Pyramid



Convenience

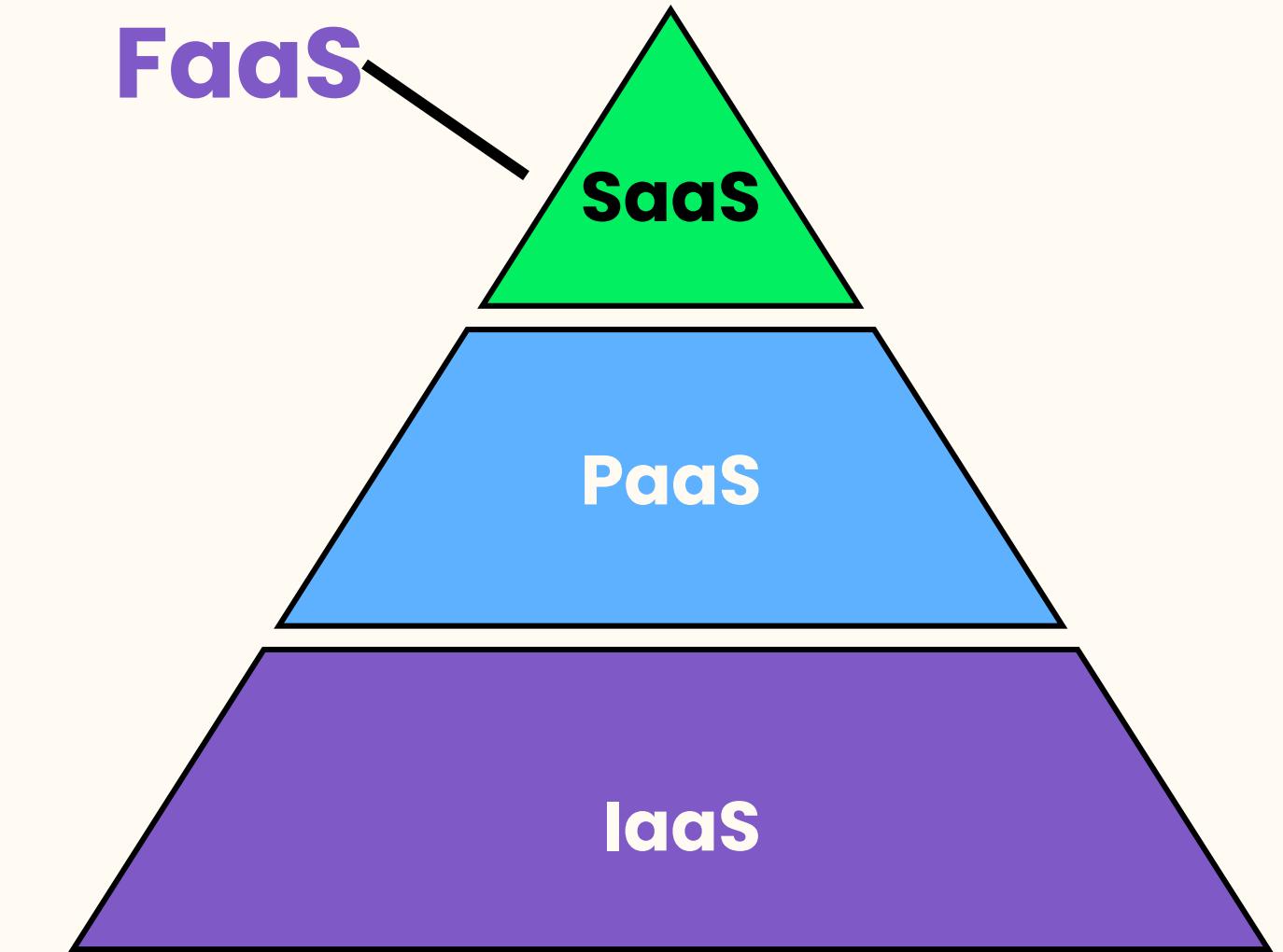
Control



Other Cloud Service Models

Function as a Service (FaaS)

- Serverless computing
- Focuses on a function (part of the software)
- e.g. identity authentication, payment transactions
- Pay for what you use!



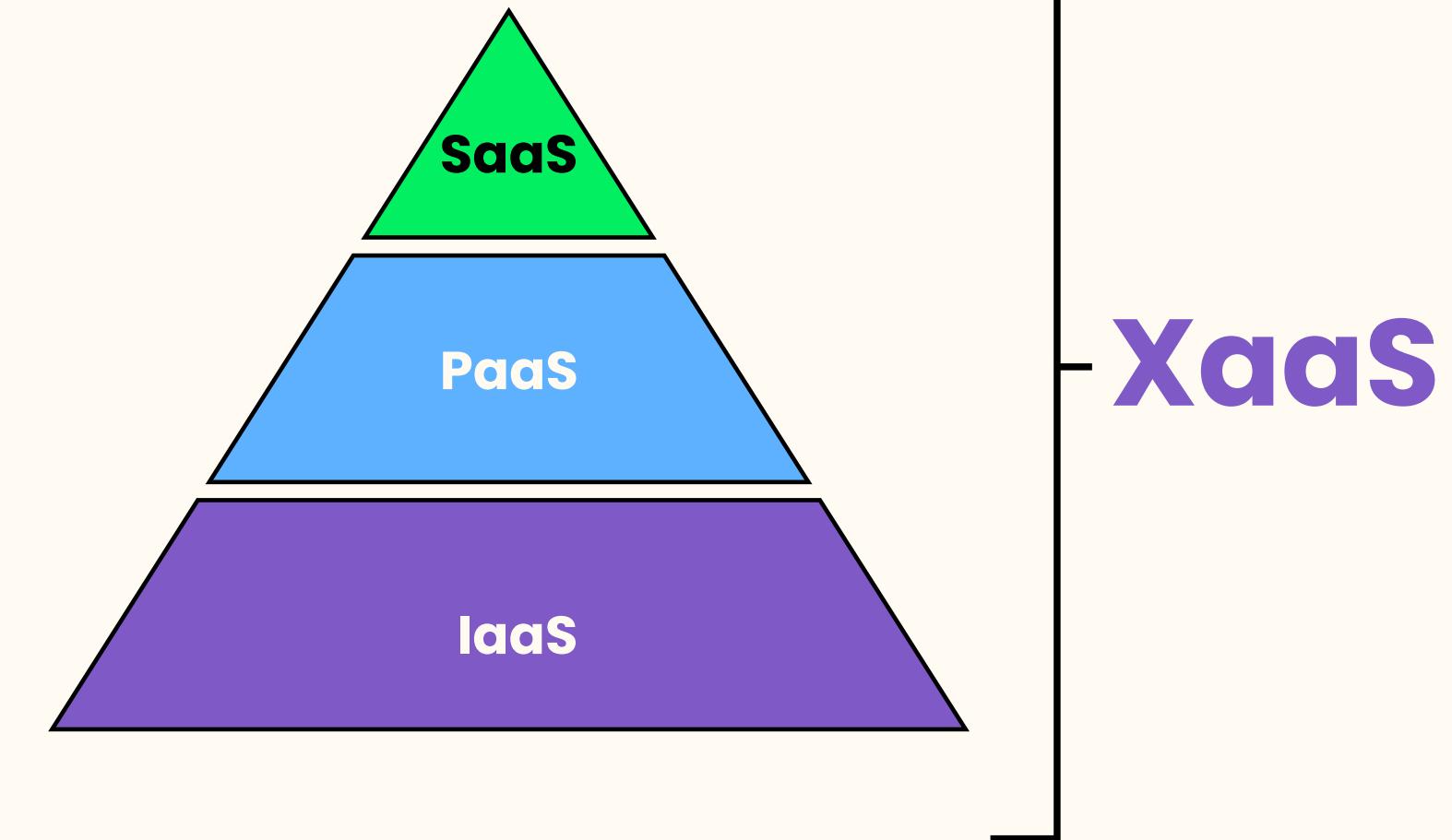
Other Cloud Service Models

Anything as a Service (XaaS)

Covers everything from databases to disaster recovery



Google Cloud



Let's
PRACTICE!

Understanding Cloud Computing

