Describe Cloud Concepts
-
AZURE FUNDAMENTALS

**Introduction to Cloud technologies
& AZ-900 certification preparation**

Introduction

Steven VINCENT - Burgundy School of Business - Oct. 2023 -

Professional Experience

Digital Marketing intern
Akor Consulting
2018

Data Engineer
PwC Luxembourg
06.2020 - 03.2022

Data Engineer
Société Générale
03.2022 - Now

The Different Data Roles

Data Analyst
In charge of building dashboards and analysis

ML Engineer
In charge of building machine learning pipelines

Data Engineer
In charge of developing Big data ETL data pipelines and data acquisition

BI Engineer
In charge of Data Warehouse, views, reports (Low Code ETL development)

Data Scientist
In charge of building predictions models and getting data insights

Data Architect
In charge of choosing and improving the data infrastructure
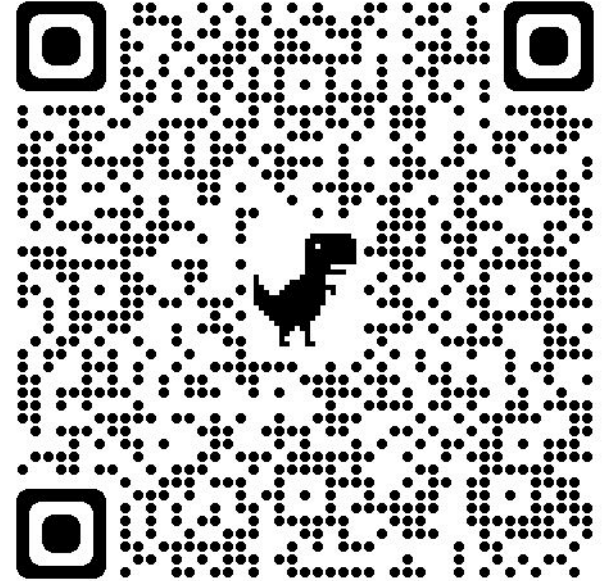
DataOps Engineer
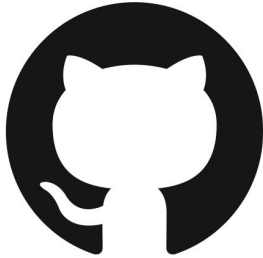In charge of data change management (CI/CD, Devops, release)

Installation

Environment setup

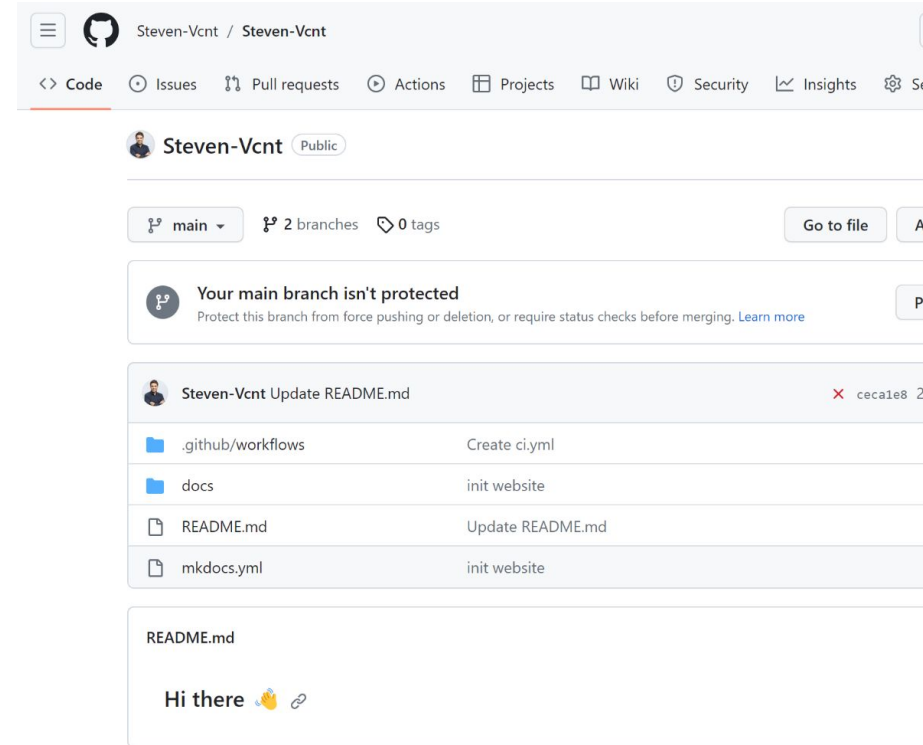https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/0.installation/

Create your GitHub Account

GitHub is a platform for software development and version control using Git, allowing developers to store and manage their code.

[GitHub](#)

Databricks free edition

Explore and build all kinds of data and AI projects — from dashboards to forecasting models to AI chatbots and agents

[Databricks](#)

Install Visual Studio Code
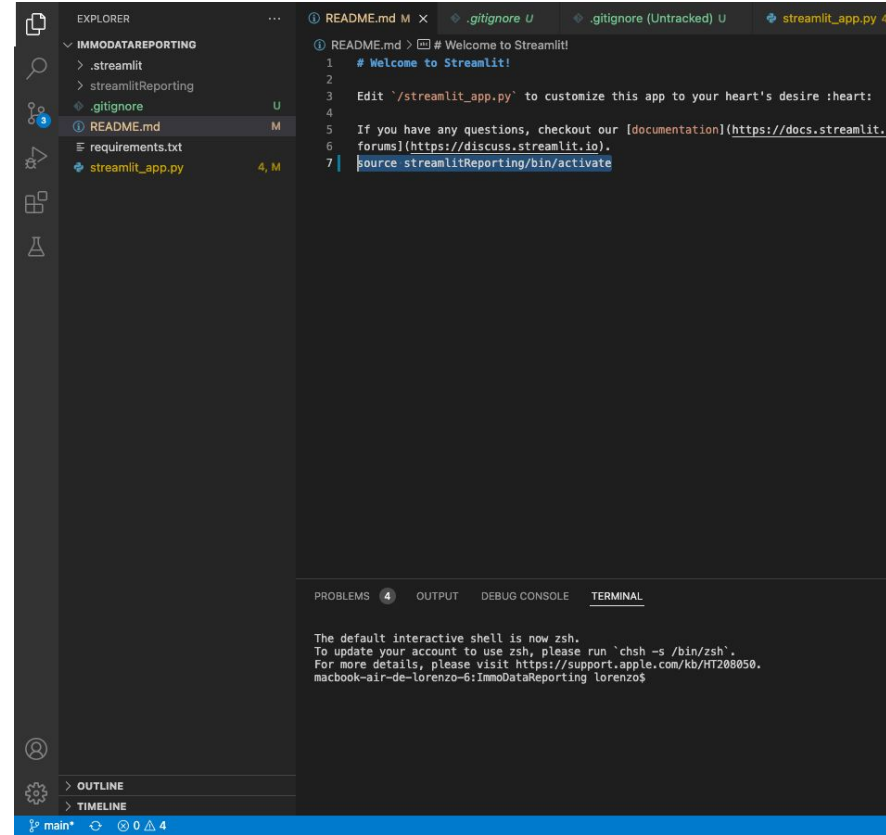

Visual Studio Code is an IDE developed by Microsoft which aims you to program in different languages like Python.

Visual Studio Code – Code Editor | Microsoft Azure

Install GitHub Desktop
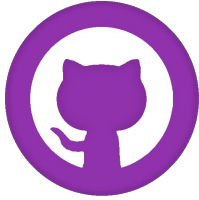
GitHub Desktop aims to facilitate the use of Github and manage easily your repositories, commits, branches.

[GitHub Desktop](#)
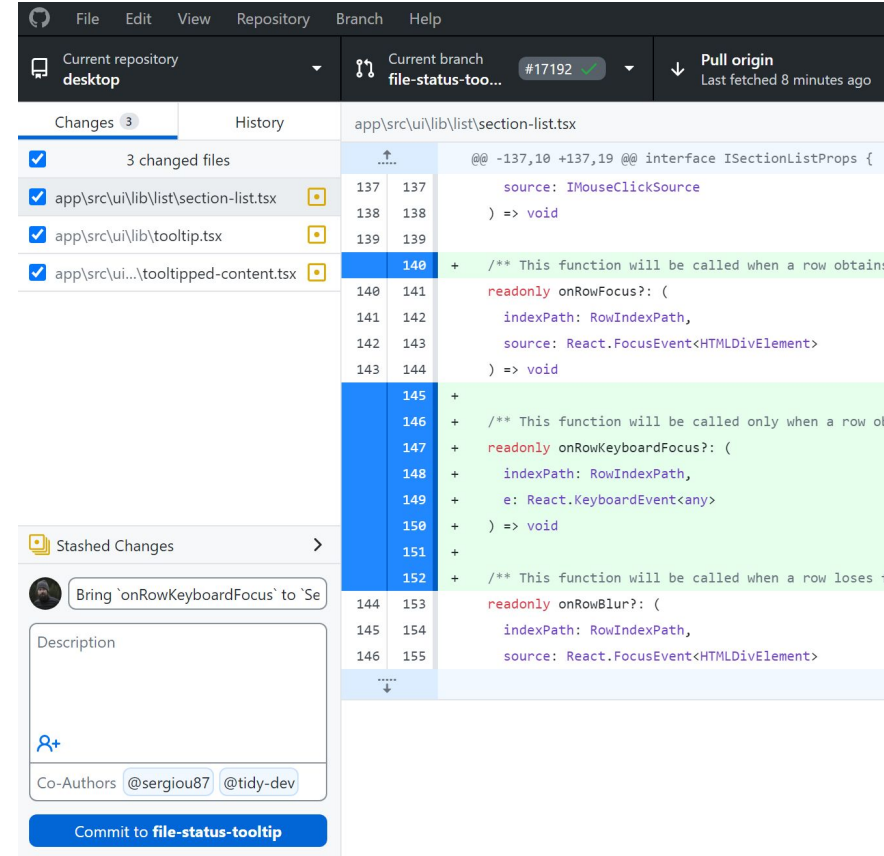
Azure Certification introduction - AZ 900

Steven VINCENT - Burgundy School of Business -
Oct. 2023 -

AZ 900 Azure Fundamentals

4 AZ-900 certifications Sessions

Azure Fundamentals Courses via Microsoft Learn

AZ-900 Labs

Microsoft CERTIFIED

AZURE FUNDAMENTALS

AZ 900 Certification
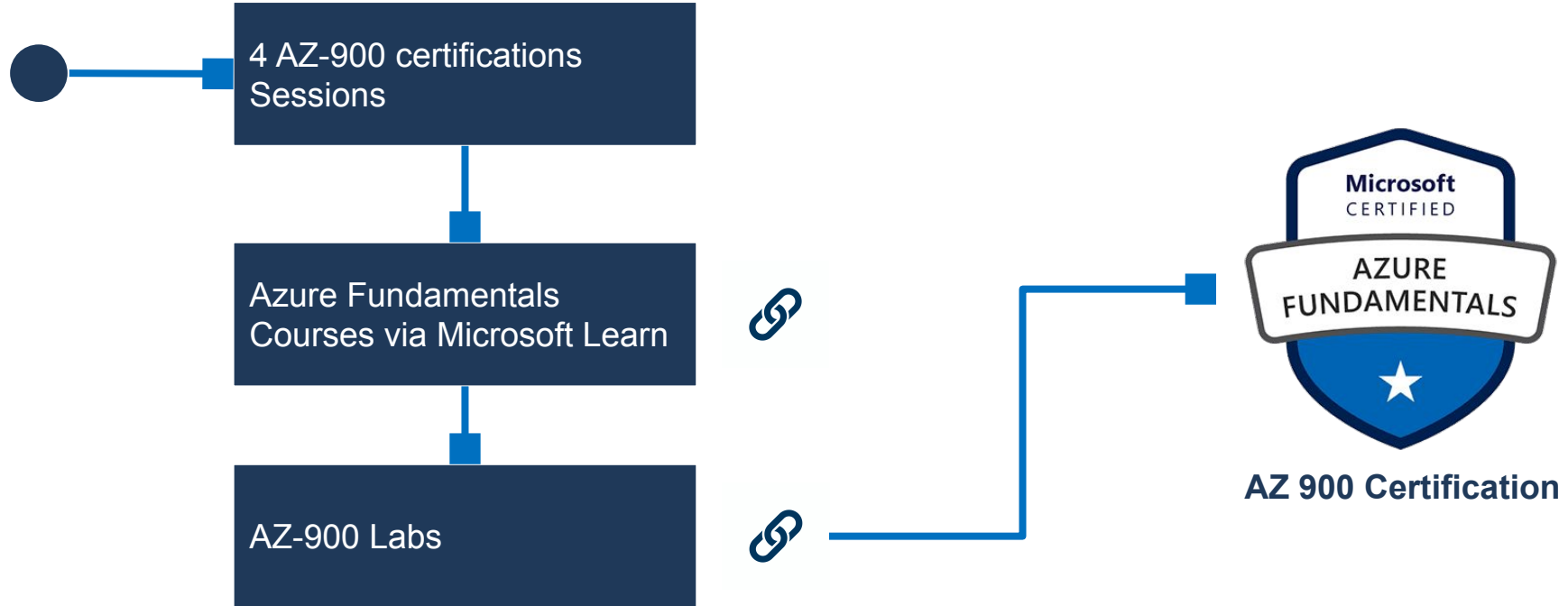
Skills measured

Demonstrating your knowledge of cloud concepts, models, and services and showing your expertise in Azure.

AZ-900 Domain Area	Weight
Describe cloud concepts	25-30%
Describe Azure architecture and services	35-40%
Describe Azure management and governance	30-35%

Benefits of azure certifications

- Showcase that you understand the fundamentals of Azure (LinkedIn, Resume)
- Official Certification from Azure
- Certification is worth 100$
- Once passed, you can renew for free your certification and stay updated on changes and new technologies

Licenses & certifications

Microsoft Certified: Azure Data Engineer Associate
Microsoft
Issued Oct 2021 · Expired Oct 2022
Credential ID I001-2372

Show credential ↗

How to read the exam study guide

Describe cloud concepts (25–30%)

Functional group (skill set)

Describe cloud computing

Objective (specific skill)

- Define cloud computing
- Describe the shared responsibility model
- Define cloud models, including public, private, and hybrid
- Identify appropriate use cases for each cloud model
- Describe the consumption-based model
- Compare cloud pricing models

May include topics: You should be able to perform each of these before taking the exam

Exam basics

How to pass the exam?
- Scores are reported on a scale of 1 to 1000.
- You need a passing score of 700 or greater
- 700 may not equal 70% of the points

How many questions?
- 35 to 50 questions
- Questions may be worth more than 1 point depending on the difficulty of the question
- Go with your gut and don't overthink
- Answer all the questions as there is no penalty for guessing
- You can mark items for review and take another look, some questions cannot be revisited

How much time?
- 65 minutes: 45 minutes to answer questions and 20 minutes for miscellaneous

What type of question?
- It is more than just multiple-choice questions
    - Build list
    - Hot area
    - Active screen
    - Drag and drop

Answer every question!

Question example

Item Stem

Technical Environment	
Business Plan / Problem	
Goal Statement	You need to ensure that you are monitoring cost consumption of Azure usage.
Question Statement	What tool should you use?

Item Options

Option A	Resource monitor
Option B	Pricing calculator
Option C	Budget alerts
Option D	

Exam Sandbox

Describe cloud concepts

Chapter study guide

Describe cloud concepts (25–30%)

Describe cloud computing
- Define cloud computing
- Describe the shared responsibility model
- Define cloud models, including public, private, and hybrid
- Identify appropriate use cases for each cloud model
- Describe the consumption-based model
- Compare cloud pricing models

Describe the benefits of using cloud services
- Describe the benefits of high availability and scalability in the cloud
- Describe the benefits of reliability and predictability in the cloud
- Describe the benefits of security and governance in the cloud
- Describe the benefits of manageability in the cloud

Describe cloud service types
- Describe infrastructure as a service (IaaS)
- Describe platform as a service (PaaS)
- Describe software as a service (SaaS)
- Identify appropriate use cases for each cloud service (IaaS, PaaS, SaaS)

CLOUD COMPUTING

Cloud computing components & key characteristics

Cloud components:

Computing power   Storage   Networking

Artificial Intelligence   IoT (Internet of Things)

Key characteristics:

Scalability

Elasticity

Agility

Fault tolerance

Disaster recovery

High availability

S. VINCENT - BSB - Oct 2023

Main types of cloud computing
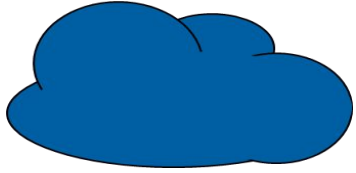
Public Cloud
Cloud computing delivered via internet and shared across organizations

Hybrid Cloud
Cloud computing using private and public cloud

Private Cloud
Cloud computing dedicated to your organization

Multi-Cloud
Use of different Public Cloud in the same time (AWS - Azure)

On-premise vs Cloud Infrastructure

Cost

Global Scale

Security

Performance

Speed

Reliability

Productivity

Microsoft Azure platform

S. VINCENT - BSB - Oct 2023

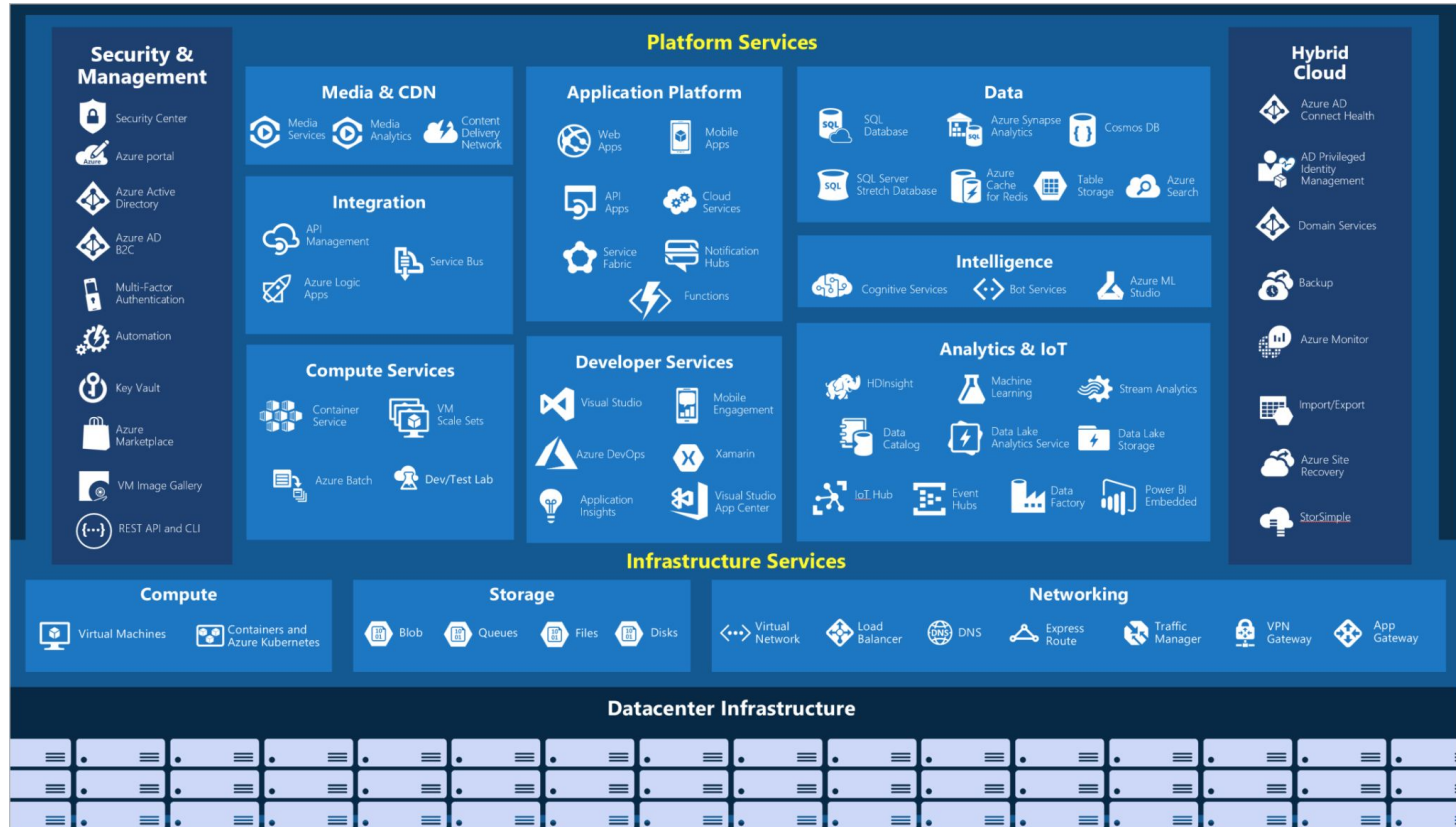# DEVELOPMENT OF CLOUD COMPUTING

Steven VINCENT - Burgundy School of Business - Oct. 2023 -

History of Cloud Computing

ARPANET creation
First computer
network

Cloud Computing
First coined by Compaq
for distributed computing

AWS creation
Amazon started to
commercialize EC2 VM

**195
0**

**196
9**

**1970-9
0**

**199
6**

**199
9**

2000-06

IBM Mainframe creation
Million dollar server room
with multiple user access

Virtual Machine
IBM developments
of VM and VPN

**First application over the
internet**
First SAAS product by
Salesforce

Overview of the Cloud ecosystem
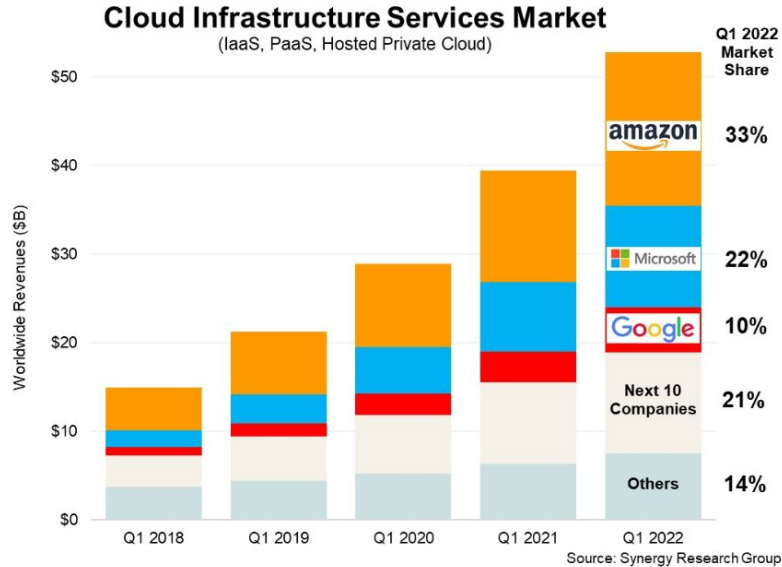
Cloud market shares

Amazon annual report 2022

Amazon Annual report Net Sales in Millions

	Year Ended December 31,		
	2014	2015	2016
Net Sales:			
North America	$ 50,834	$ 63,708	$ 79,785
International	33,510	35,418	43,983
AWS	4,644	7,880	12,219
Total consolidated	$ 88,988	$ 107,006	$ 135,987
Year-over-year Percentage Growth:			
North America	23%	25%	25%
International	12	6	24
AWS	49	70	55
Total consolidated	20	20	27
Year-over-year Percentage Growth, excluding the effect of foreign exchange rates:			
North America	23%	26%	25%
International	14	21	26
AWS	49	70	55
Total consolidated	20	26	28
Net Sales Mix:			
North America	57%	60%	59%
International	38	33	32
AWS	5	7	9
Total consolidated	100%	100%	100%

Amazon annual report 2017

	Year Ended December 31,	
	2020	2021
Net Sales:		
North America	$ 236,282	$ 279,833
International	104,412	127,787
AWS	45,370	62,202
Consolidated	$ 386,064	$ 469,822
Year-over-year Percentage Growth:		
North America	38 %	18 %
International	40	22
AWS	30	37
Consolidated	38	22
Year-over-year Percentage Growth, excluding the effect of foreign exchange rates:		
North America	38 %	18 %
International	38	20
AWS	30	37
Consolidated	37	21
Net sales mix:		
North America	61 %	60 %
International	27	27
AWS	12	13
Consolidated	100 %	100 %

Amazon annual report 2022

Cloud computing and its benefits

Capital Expenditure vs Operational Expenditure

Capital Expenditure

Capital expenditure is the cost a business incurs to acquire assets that will provide benefits beyond the current year.

- Long-term investment
- Upfront cost
- Full responsibility & Ownership
- Deductible over the lifetime of a tangible asset
- Overbuying for future capacity requirements

Operational Expenditure

Operating expenses refer to the money a company spends to run day-to-day operations.

- Short-term investment
- Pay-as-you-go pricing
- Limited responsibility & Ownership
- Deducted in full within the same year they are incurred
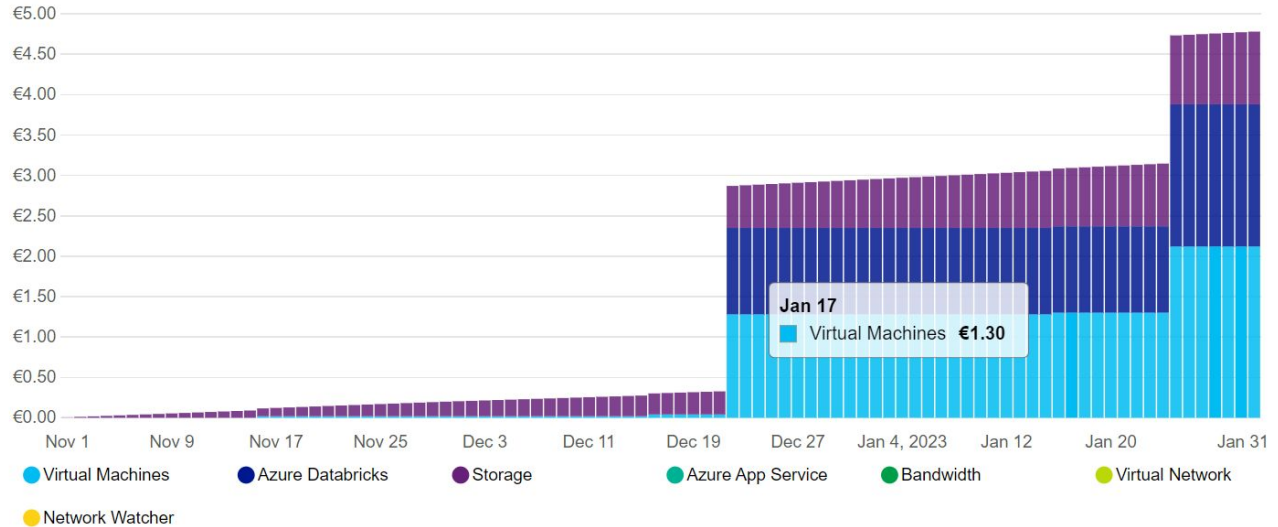- Flexibility of resource allocation

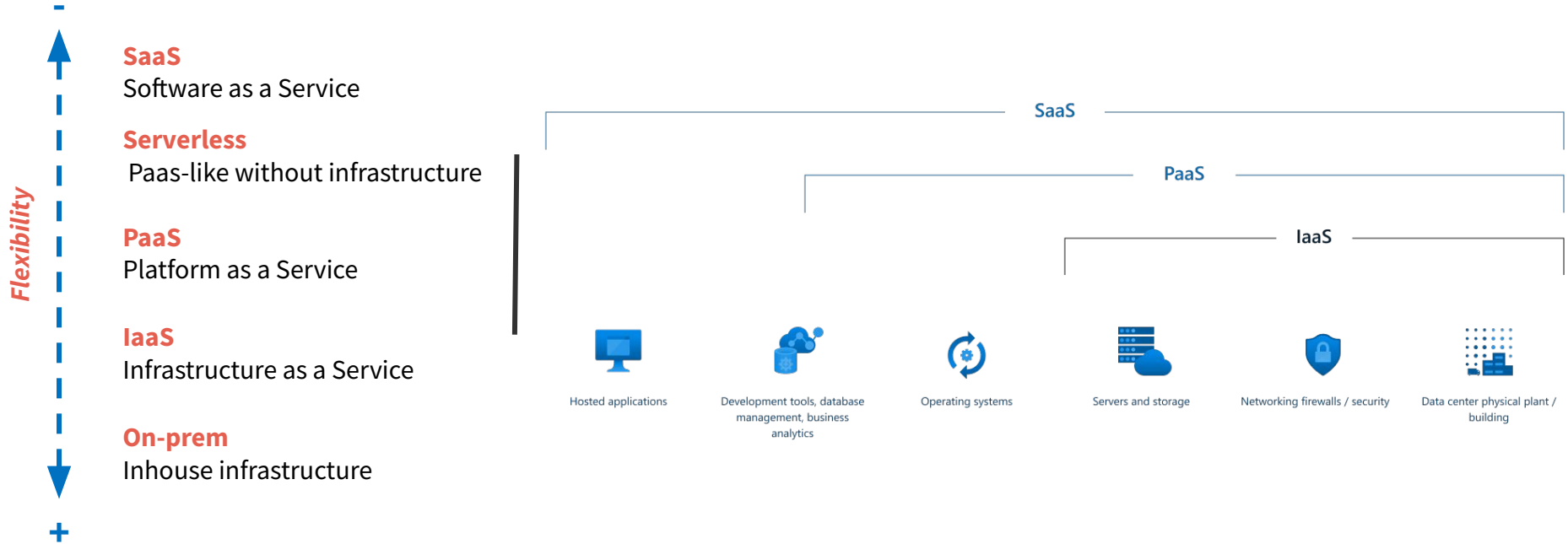# Consumption based model

No upfront costs

No wasted resources

Pay for additional resources when needed
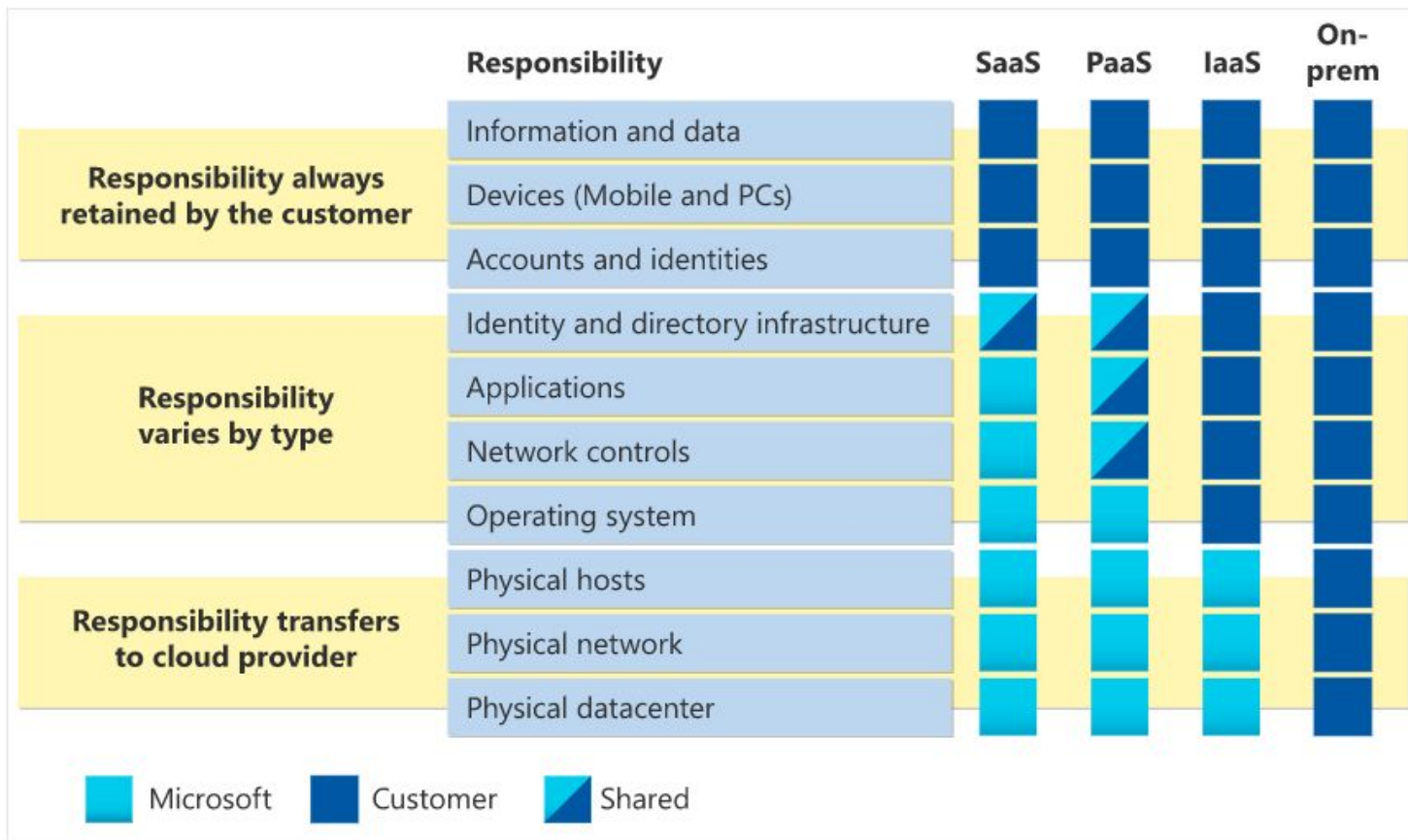
Stop paying at any time

Describe cloud service types

On-prem, IAAS, PAAS and SAAS

Flexibility

SaaS
Software as a Service

Serverless
 Paas-like without infrastructure

PaaS
Platform as a Service

IaaS
Infrastructure as a Service

On-prem
Inhouse infrastructure

SaaS

PaaS

IaaS

Hosted applications

Development tools, database management, business analytics

Operating systems

Servers and storage

Networking firewalls / security

Data center physical plant / building

Shared Responsibility Model

	Responsibility	SaaS	PaaS	IaaS	On-prem
Responsibility always retained by the customer	Information and data	Customer	Customer	Customer	Customer
	Devices (Mobile and PCs)	Customer	Customer	Customer	Customer
	Accounts and identities	Customer	Customer	Customer	Customer
Responsibility varies by type	Identity and directory infrastructure	Shared	Shared	Customer	Customer
	Applications	Microsoft	Shared	Customer	Customer
	Network controls	Microsoft	Shared	Customer	Customer
	Operating system	Microsoft	Microsoft	Customer	Customer
Responsibility transfers to cloud provider	Physical hosts	Microsoft	Microsoft	Microsoft	Customer
	Physical network	Microsoft	Microsoft	Microsoft	Customer
	Physical datacenter	Microsoft	Microsoft	Microsoft	Customer

Legend: ■ Microsoft ■ Customer ◥ Shared

Service types example

IAAS	PAAS	SAAS
- Lift-and-shift migration - Testing & development	- Development Framework - Analytics or business intelligence	- Email and messaging. - Business productivity applications. - Finance and expense tracking.

Quizz session

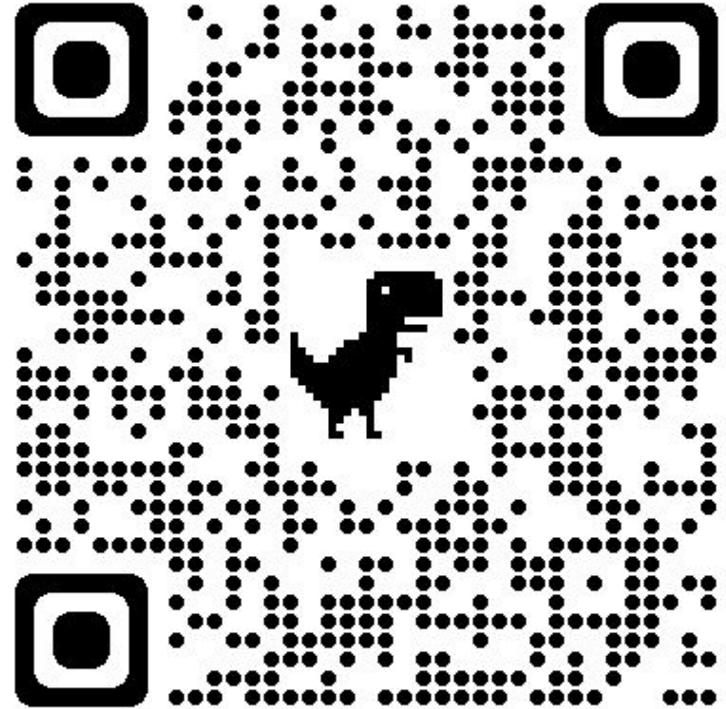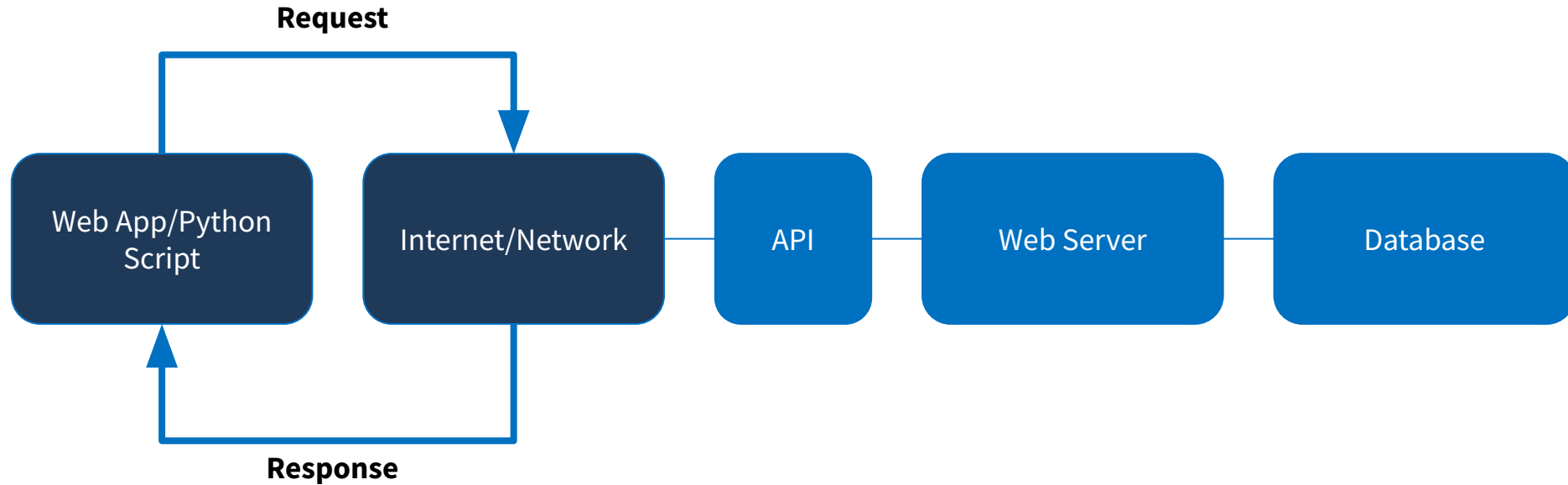https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/1.describe_cloud_concepts/

Describe Cloud Concepts

WORKSHOP

Python Basics

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/2.python_basics/

API - Application Programming Interface

Request

Web App/Python Script	Internet/Network	API	Web Server	Database

Response

API Basics

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/3.api_basics/

Pandas DataFrame Join
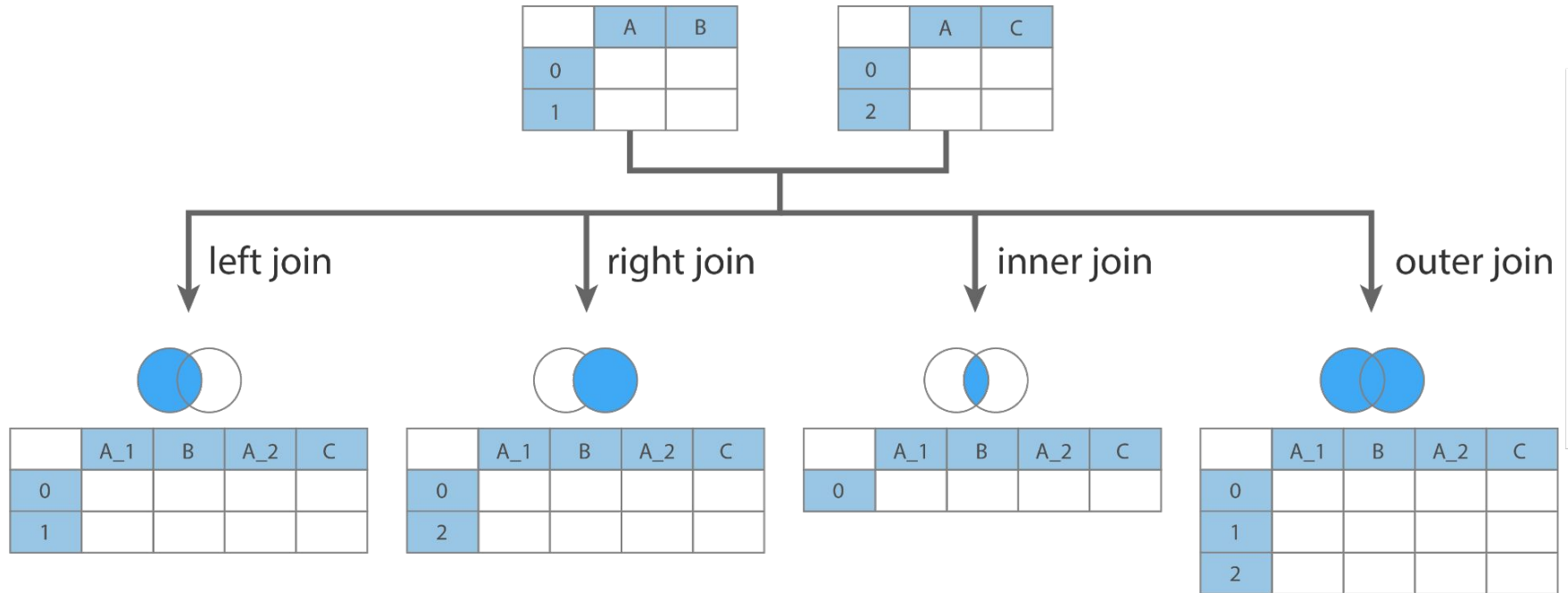
Python Pandas DataFrame Join, Merge, and Concatenate | by Jiahui Wang |
Towards Data Science

pd.json_normalize() - Normalize JSON data into a flat table

```python
data = [
    {
        "id": 1,
        "name": "Cole Volk",
        "fitness": {"height": 130, "weight": 60},
    },
    {"name": "Mark Reg", "fitness": {"height": 130, "weight": 60}},
    {
        "id": 2,
        "name": "Faye Raker",
        "fitness": {"height": 130, "weight": 60},
    },
]
```
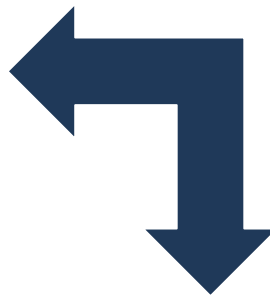
	id	name	fitness.height	fitness.weight
0	1.0	Cole Volk	130	60
1	NaN	Mark Reg	130	60
2	2.0	Faye Raker	130	60

pandas.json_normalize — pandas 2.1.1 documentation

Pivot & Unpivot table

City	Population	Unit
Paris	2	M
Lyon	500	K
Saint-Emilion	1,8	K

Unit	Paris	Lyon	Saint-Emilion
K	None	500	1,8
M	2	None	None
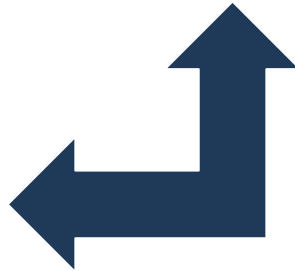
pandas.melt — pandas 2.1.1 documentation
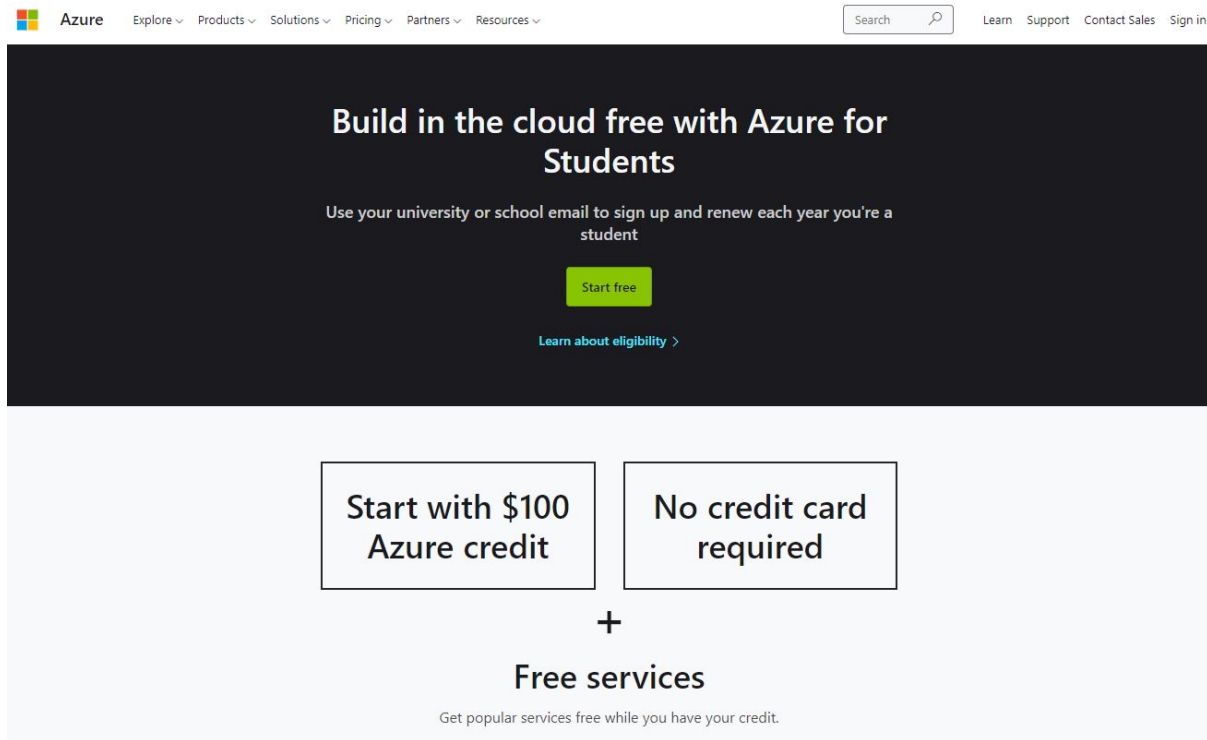
Azure Setup

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/4.azure_setup/

Setup Azure Student Account

Create a new account the bsb mail address : Azure for Students – Free Account Credit

Setup Azure Environment

Resource groups

+ Create   👁 View

Container that holds related resources for an Azure solution

Cost Management + Billing

👁 View

Better manage cloud spend by managing costs across all your clouds with a single, unified view.

Storage accounts

+ Create   👁 View

Contains all of your Azure Storage data objects, including blobs, file shares, queues, tables, and disks.