The Cloud

Infrastructure, Vulnerabilities, & Security

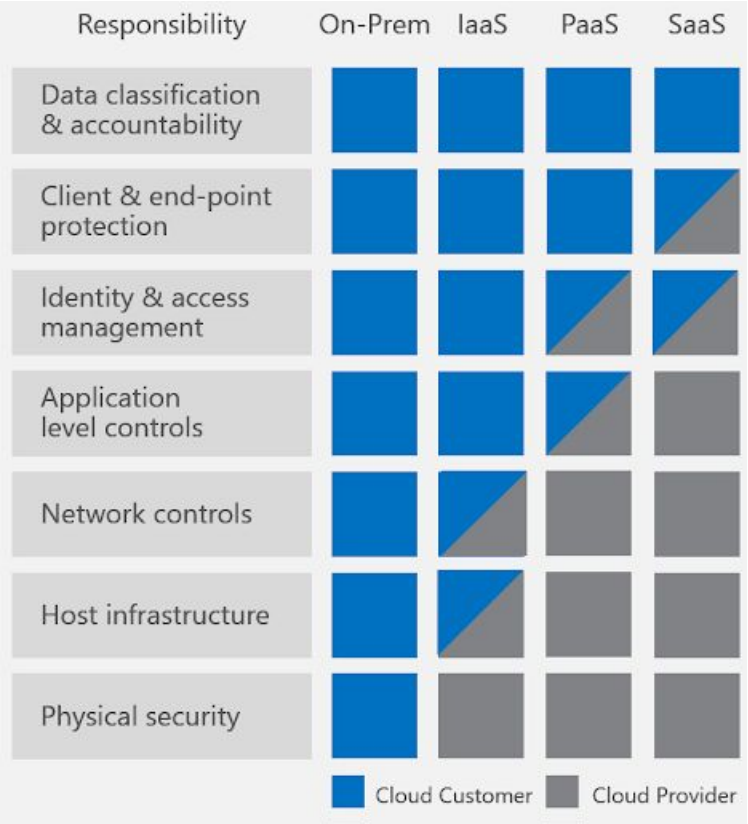
What is the Cloud?

- A network of remote servers hosted on the internet
  - Remote servers offer greater scalability, reliability, and lower cost compared to local servers
- Used to store, manage, and process data
- Allows users to access and utilize computing resources and services on-demand and anywhere

The Cloud & Cyber

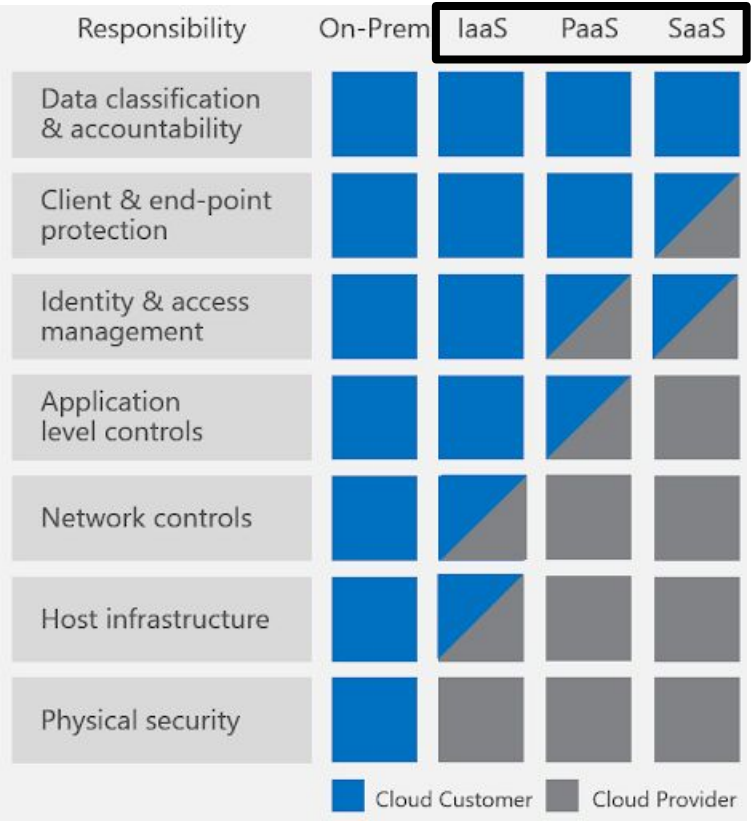
- Responsibility Matrix (IaaS, PaaS, SaaS)
- Hybrid considerations
- Multi-Cloud Systems
- Third-party vendors
- Serverless
- Cloud Vulnerabilities
- Securing The Cloud
- Bonus: SASE

Responsibility Matrix



- Businesses utilize clouds made by large companies or cloud service providers
- Security responsibilities between the customer and cloud provider are given through a responsibility matrix

_aaS



- Businesses run many different services on the cloud, including Infrastructure as a Service, Platform as a Service, and Software as a Service
- Each is a model of cloud computing services

IaaS, PaaS, SaaS

IaaS:

Provides virtualized computing resources over the internet (VMs, storage, networks…)

High level of control over OS, storage, and deployed applications.

Amazon Web Services (AWS) & Microsoft Azure

PaaS:

Hardware & software tools that provide a platform to develop & manage applications without dealing with underlying infrastructure.

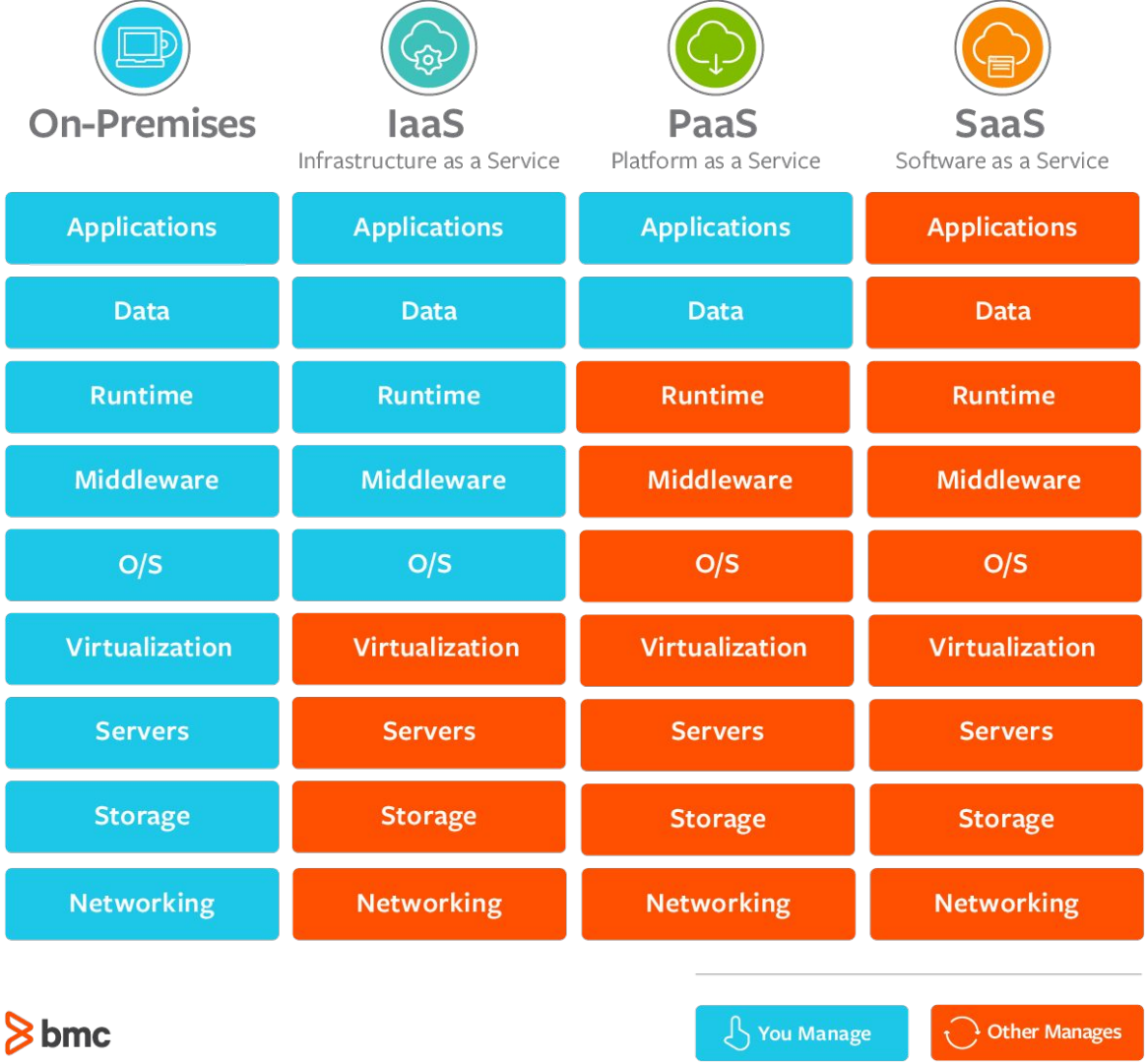
Less control over hardware and OS; focus is on the development and deployment of applications.

SaaS:

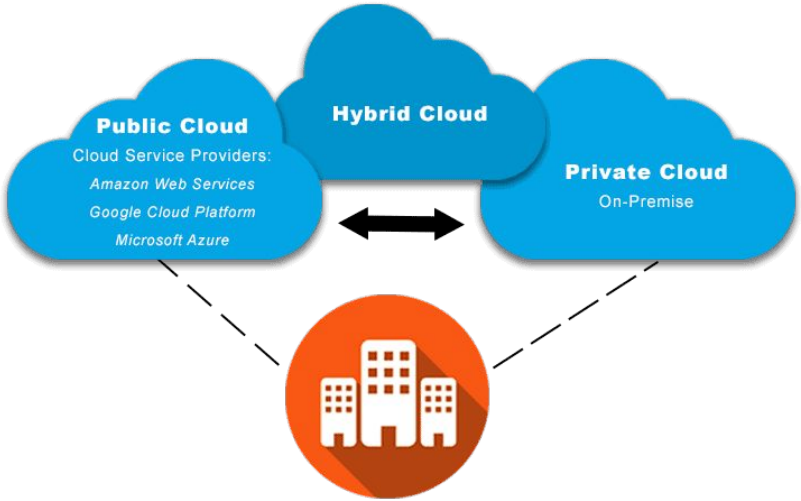
Subscription software applications accessed through a web browser, eliminating installation and maintenance.

Minimal control; users do not manage underlying infrastructure or platform.

Google Workspace & Microsoft 365


On-Premises
IaaS
Infrastructure as a Service
PaaS
Platform as a Service
SaaS
Software as a Service
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking
bmc
You Manage
Other Manages

Hybrid considerations



A hybrid cloud refers to the usage of multiple clouds, public and private, across multiple cloud providers.

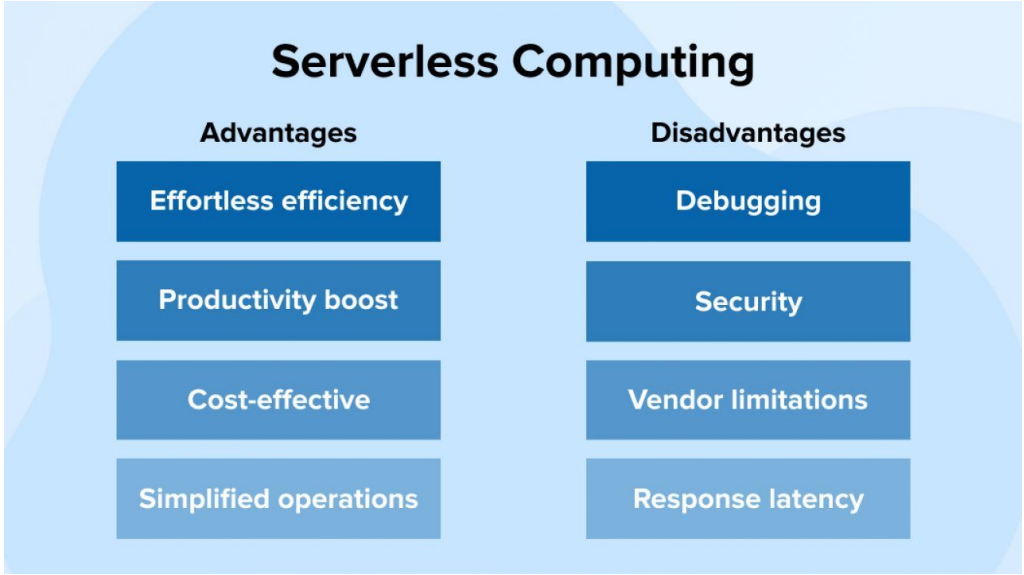
Hybrid Pros & Cons

- Adds flexibility, but also complexity
- Providers may have incompatible systems
  - May have to manually configure security settings for each
- Monitoring security may be difficult, as logs are cloud-specific.

Third-Party Vendors

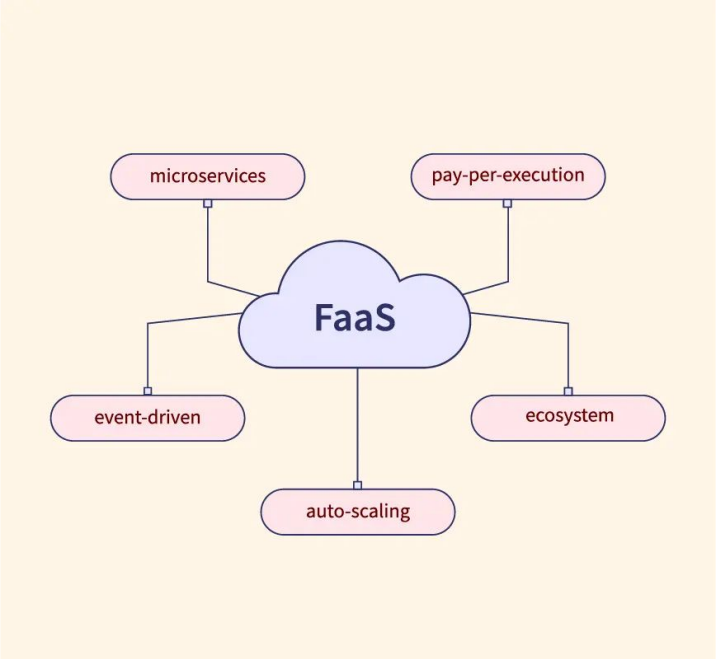
- Third-party vendors provide cloud-related applications & services.
- With vendors comes risk & the need to mitigate it

Serverless



- Cloud computing model
- Cloud provider dynamically manages server allocation
- Developers deploy code devoid of server management, scaling, or capacity planning

Serverless & FaaS



- Serverless is a superset of functions as a service (FaaS):
  - Applications are broken down into smaller functions
  - Functions executed in response to events
  - Scalability
  - Cost-efficiency
  - Reduced operational overhead

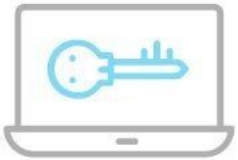
Cloud Vulnerabilities

- Insecure Interfaces and APIs
- Data Breaches
- Account Hijacking
- Insufficient Identity Access Management (IAM)
- Insecure Configuration
- Malware Infiltration

Today's Biggest Cloud Threats

68%

Misconfiguration of the cloud platform/ wrong setup



58%

Unauthorized access

52%

Insecure interfaces /APIs

Hijacking of accounts, services or traffic

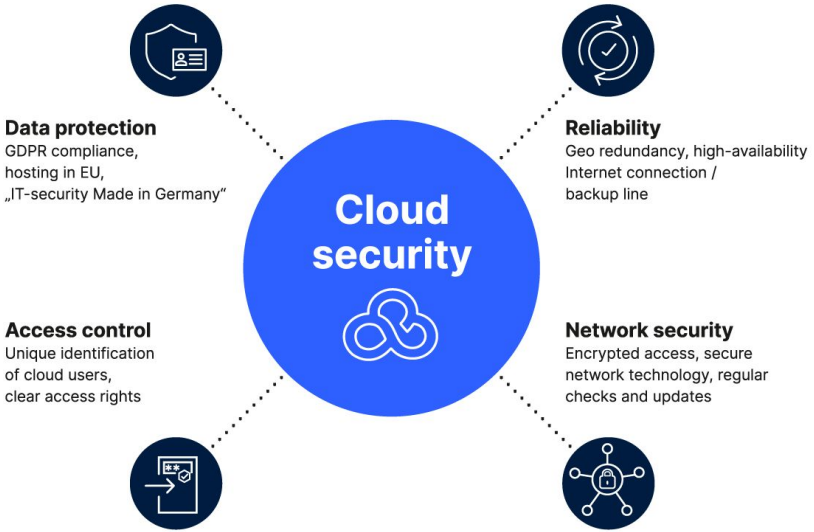
External sharing of data

Malicious insiders

Foreign state-sponsored cyber attacks

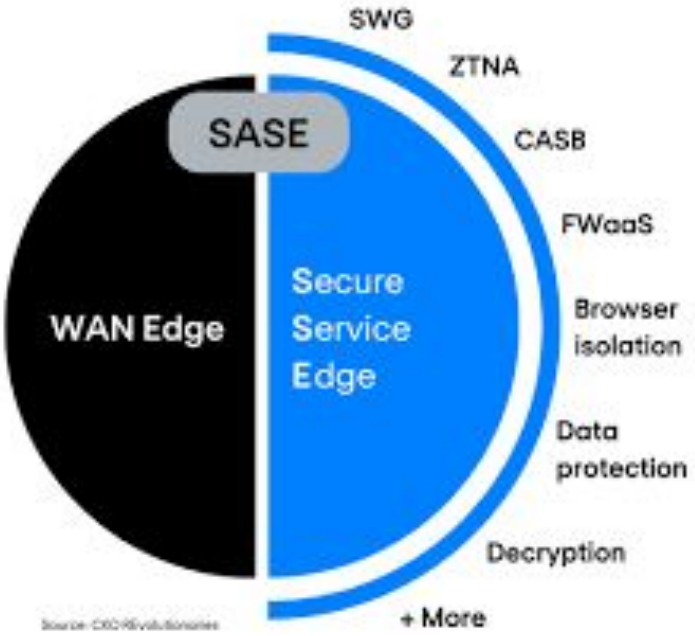
Denial of service attacks

Securing the Cloud



- Risk transference
- Multi-Cloud Systems
- Endpoint Detection & Response
- Principle of Least Privilege
- Backups
- Data Encryption…

Secure Access Service Edge



- Network architecture
- Combines wide-area networking (WAN) capabilities with security services, delivered as a cloud-based service
- Integrates SD-WAN with security functions
- Automatically connects remote users to nearby cloud gateways instead corporate data centers


On-network
Branch
NGFW
SD-WAN
Secure WLAN/LAN
Users & Devices
SDP Agent
Off-network
Cloud Delivered FortiSASE
FWaaS
App Control
IPS
URL Filtering
SSL Inspection
Sandbox
Zero-Trust Access
CASB
WAF
salesforce
Office 365
RingCentral
SaaS
Private Cloud
aws
Azure
Google Cloud
Public Cloud