Microsoft

AZ-900

Learning path 01:
Cloud concepts

Learning path 01—outline

You will learn the following concepts:

1 **Cloud computing**

- What is cloud computing
- Shared responsibility
- Cloud models
- Capital vs operational costing

pub private

2 **Cloud benefits**

- Benefits of the cloud

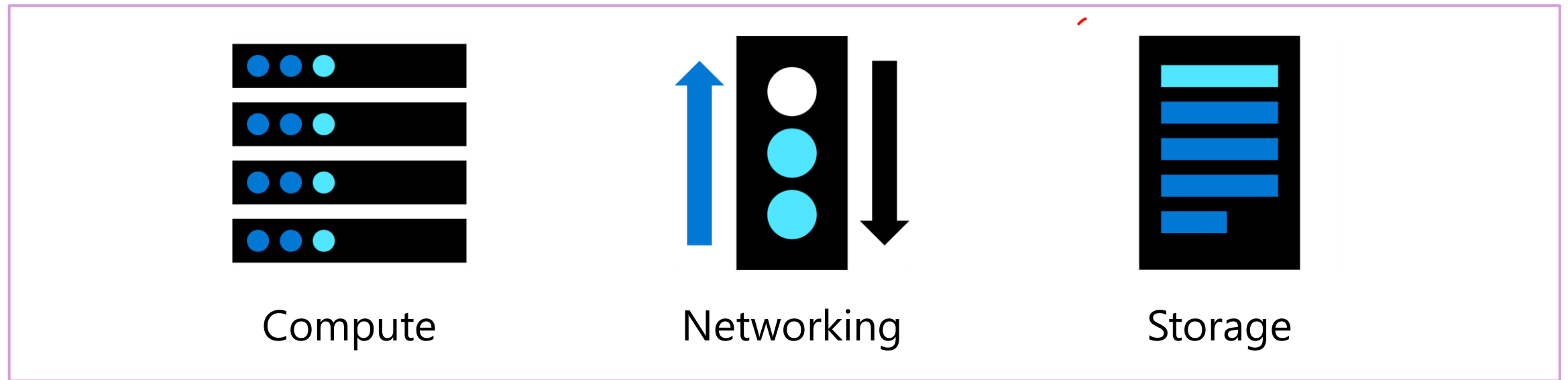**3** **Cloud service types**

- IaaS, PaaS, and SaaS

Cloud computing

What is cloud computing?

Cloud computing is the delivery of computing services over the internet, enabling faster innovation, flexible resources, and economies of scale.

Compute   Networking   Storage

VM   Docker   TCP/IP   Storage Account
Container   IPv6   DB

Serverless Comp.

Private cloud ✓ = On Prem IT mit MsT Kriterien

- Organizations create a cloud environment in their datacenter.

- Organizations are responsible for operating the services they provide.

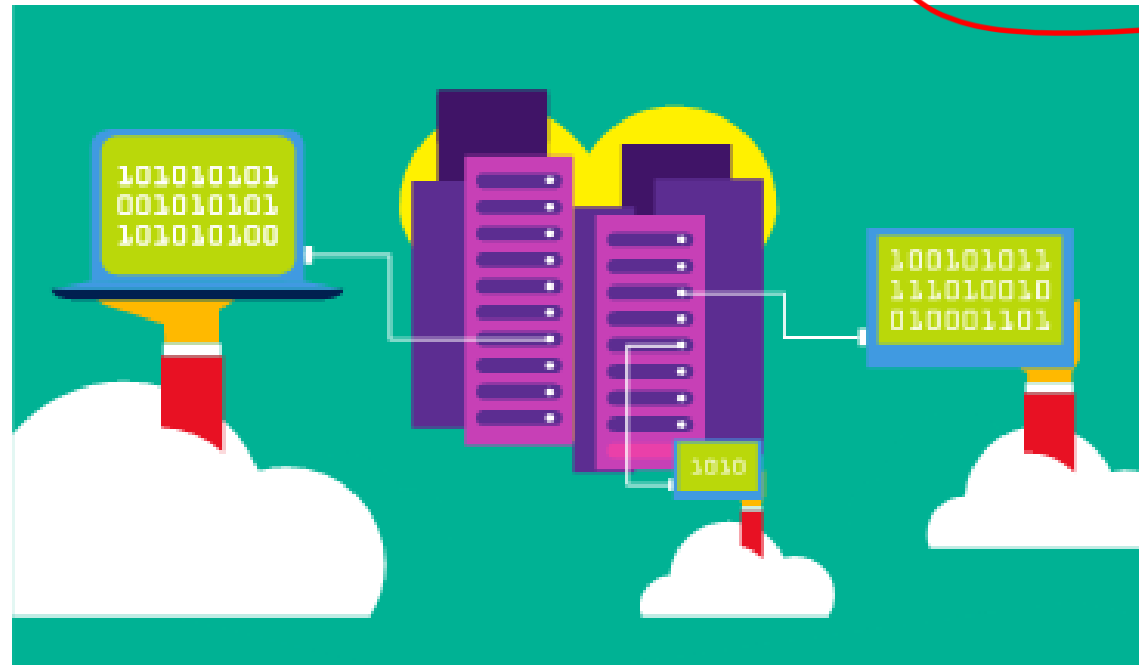- Does not provide access to users outside of the organization.

Public cloud

NIST
2011

- Self Service
- Monitoring
- Cost Verbranch
- Security

- Owned by cloud services or hosting provider.

- Provides resources and services to multiple organizations and users.

- Accessed via secure network connection (typically over the internet).

Deployment

Hybrid cloud

Combines **public** and **private** clouds to allow applications to run in the most appropriate location.

Cloud model comparison

Public cloud Azure

- No capital expenditures to scale up.
- Applications can be quickly provisioned and deprovisioned.
- Organizations pay only for what they use.

Private cloud

- Hardware must be purchased for start-up and maintenance.
- Organizations have complete control over resources and security.
- Organizations are responsible for hardware maintenance and updates.

Hybrid cloud

- Provides the most flexibility.
- Organizations determine where to run their applications.
- Organizations control security, compliance, or legal requirements.
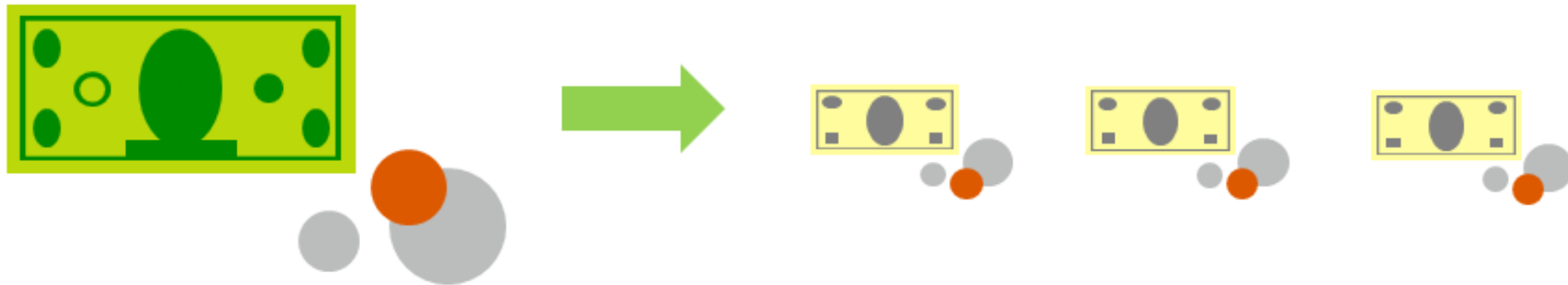
Compare CapEx vs. OpEx

Invest

Capital expenditure (CapEx)

- The upfront spending of money on physical infrastructure.

- Costs from CapEx have a value that reduces over time.

Betriebskosten

Operational expenditure (OpEx)

- Spend on products and services as needed, pay-as-you-go.

- Get billed immediately.

Consumption-based model

Cloud service providers operate on a consumption-based model, which means that end users only pay for the resources that they use.

- Better cost prediction.

- Prices for individual resources and services are provided.

- Billing is based on actual usage.

Cloud benefits

Cloud benefits

LB → ① ② ③

Region "westeurope"
Avail. Zone (=DC)

High availability	Elasticity
Scalability	Reliability
Predictability	Security
Governance Policies	Manageability

VM Scale Set

Nachteil:
Vendor Lock
U.S.A.

Delos   Gaia ?

Cloud service types

Infrastructure as a service (IaaS)

IaaS

Servers and storage

Networking firewalls/Security

Datacenter physical plant/building
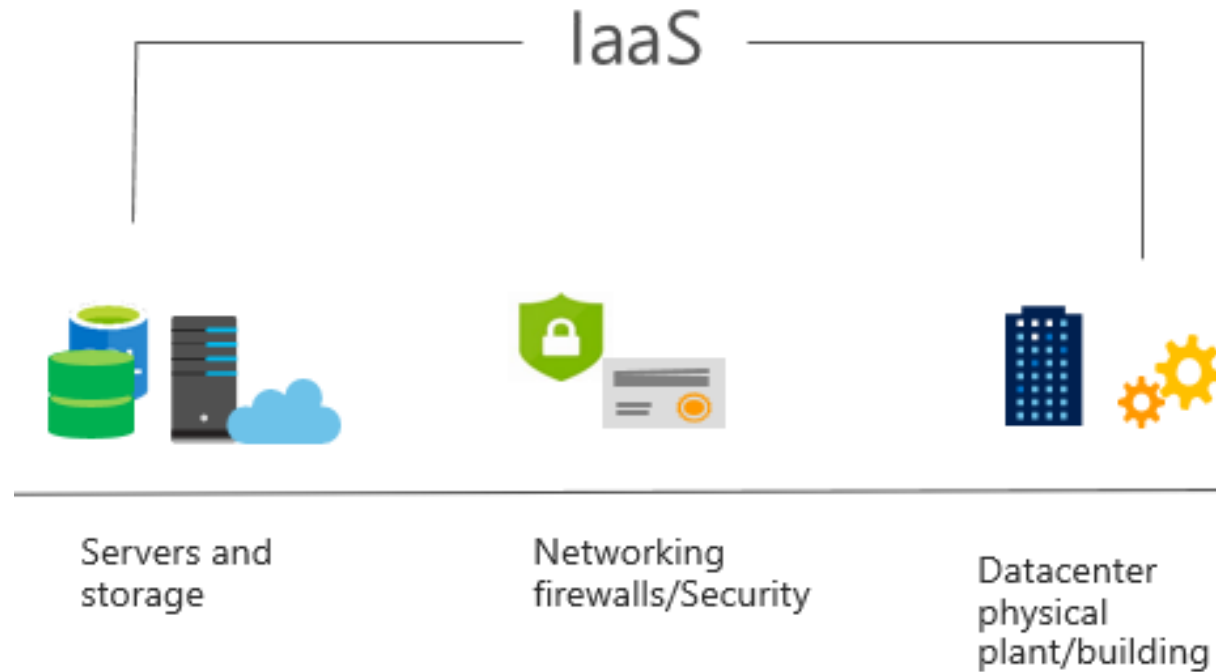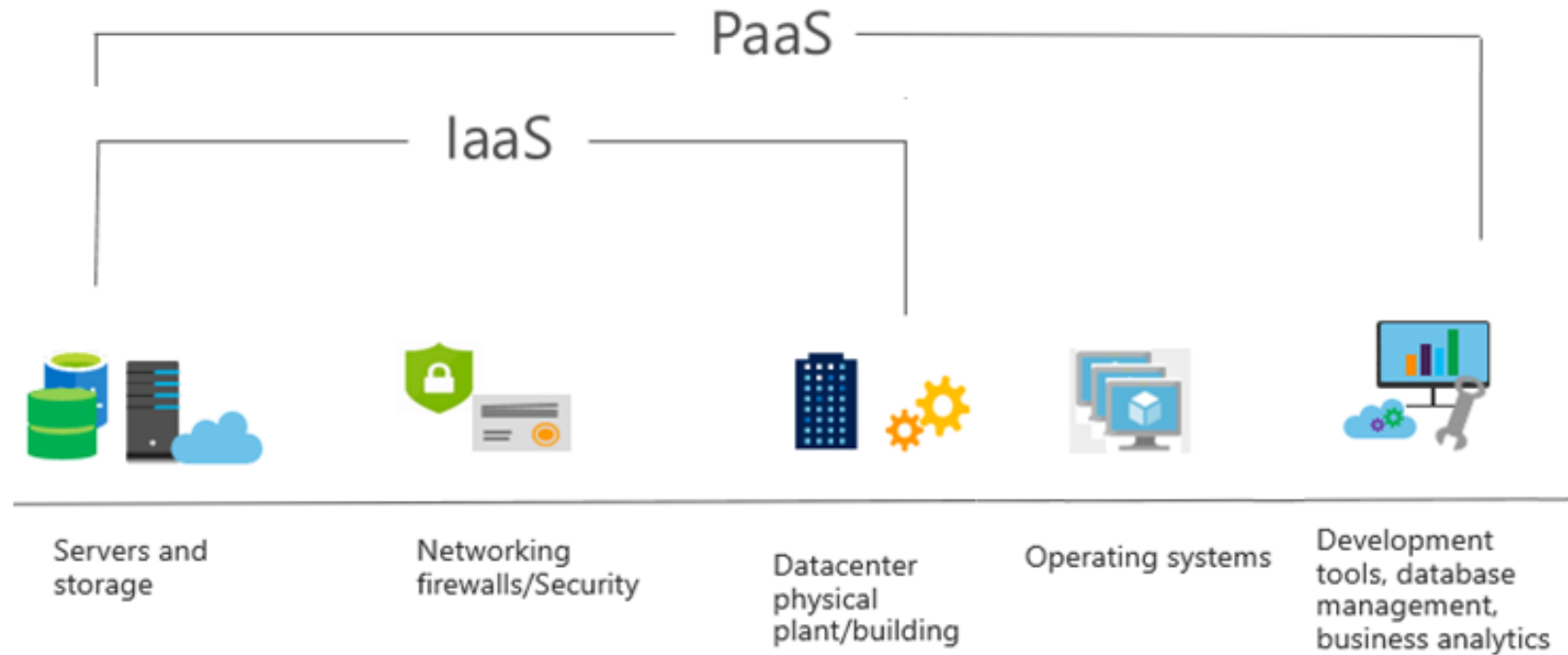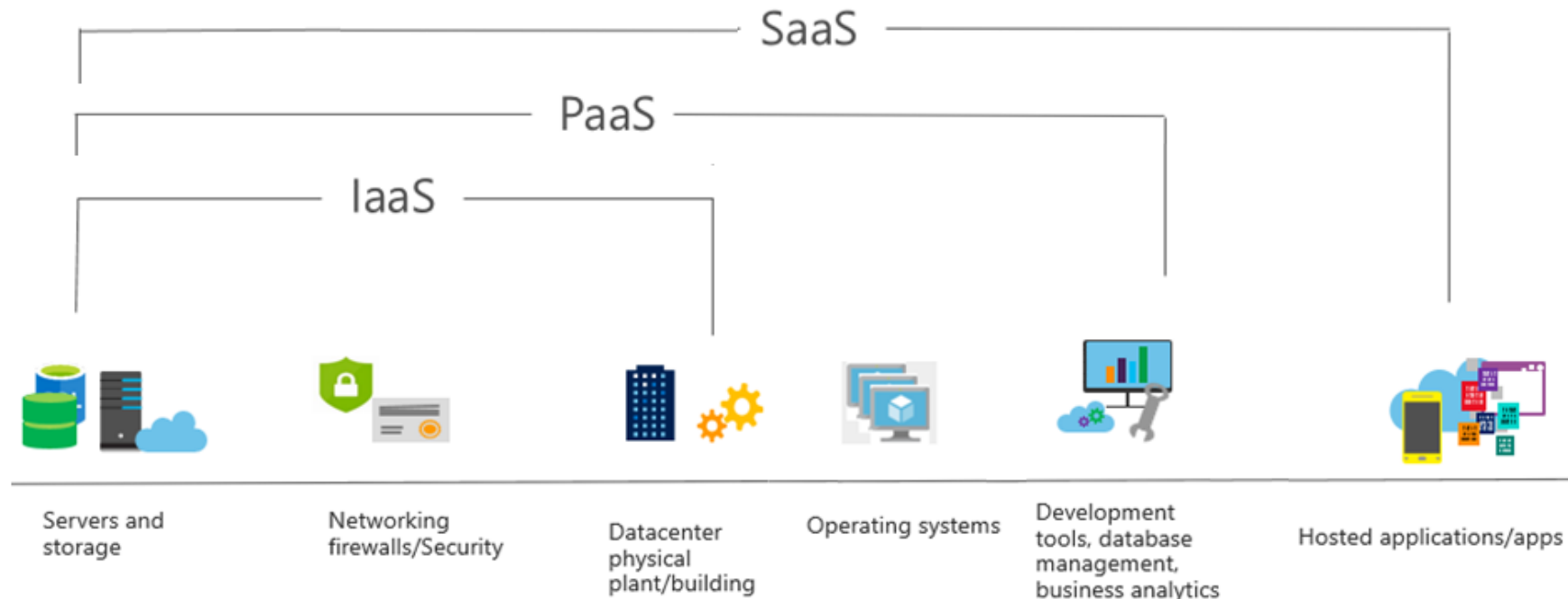
Build pay-as-you-go IT infrastructure by renting servers, virtual machines, storage, networks, and operating systems from a cloud provider.

Platform as a service (PaaS)

Provides an environment for building, testing, and deploying software applications; without focusing on managing underlying infrastructure.
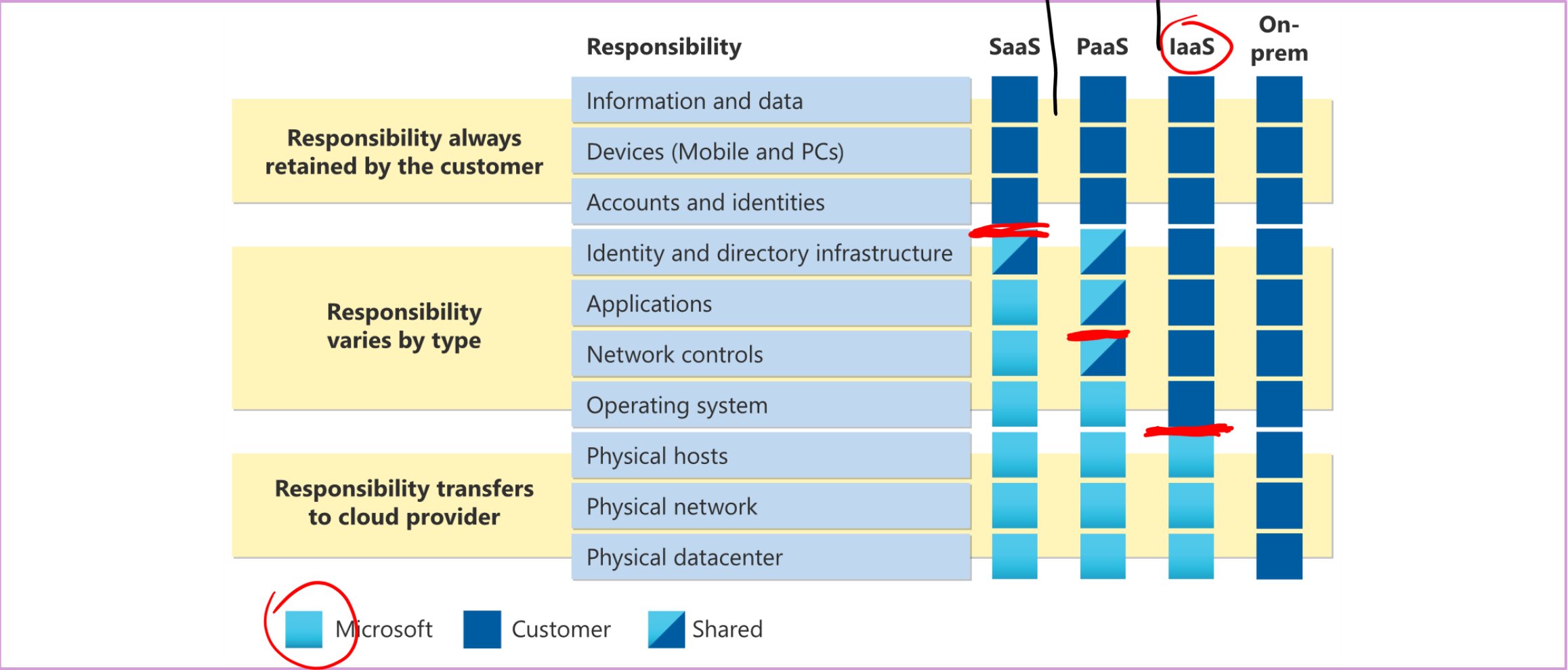
Software as a service (SaaS)

Users connect to and use cloud-based apps over the internet: for example, Microsoft Office 365, email, and calendars.

Shared responsibility model

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

■ Microsoft ■ Customer ◨ Shared

(Handwritten annotations: "Code → NIST", ".NET", "Node js", "VM", circle around "IaaS", circle around "Microsoft")

Cloud service comparison

OS

IaaS

- The most flexible cloud service.

- You configure and manage the hardware for your application.

PaaS

- Focus on application development.

- Platform management is handled by the cloud provider.

SaaS

- Pay-as-you-go pricing model.

- Users pay for the software they use on a subscription model.

Learning path 01 review

**Microsoft Learn Modules
(learn.microsoft.com/training)**

- The shared responsibility model
- Public, private, and hybrid-cloud
- Benefits of cloud computing
- Cloud service types

public

private

hybrid

IaaS

PaaS

SaaS