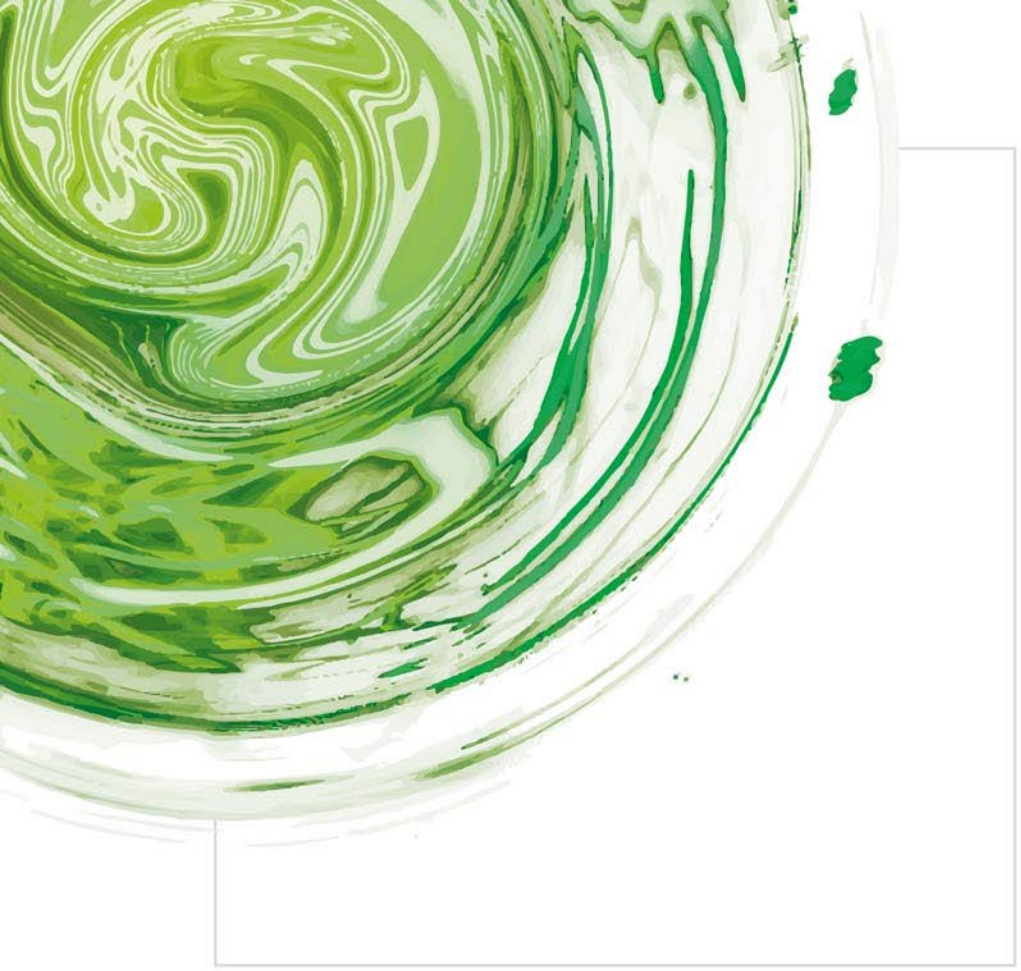

Cloud & Azure Overview

per newbie ;-)

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IAAS

RESOURCE GROUP

HYBRID CLOUD

VIRTUALIZZAZIONE

AZURE

TENANTS

On Premise

PAAS

SUBSCRIPTION

AZURE REGION

SAAS

AWS

On Premise = non sul Cloud ;-)

Cloud

It's the delivery of computing services over the internet, which is otherwise known as the cloud.

These services include servers, storage, databases, networking, software, analytics, and intelligence.

Cloud = Sharing di risorse accedute via Internet

Virtualizzazione

Hardware è separato dal software

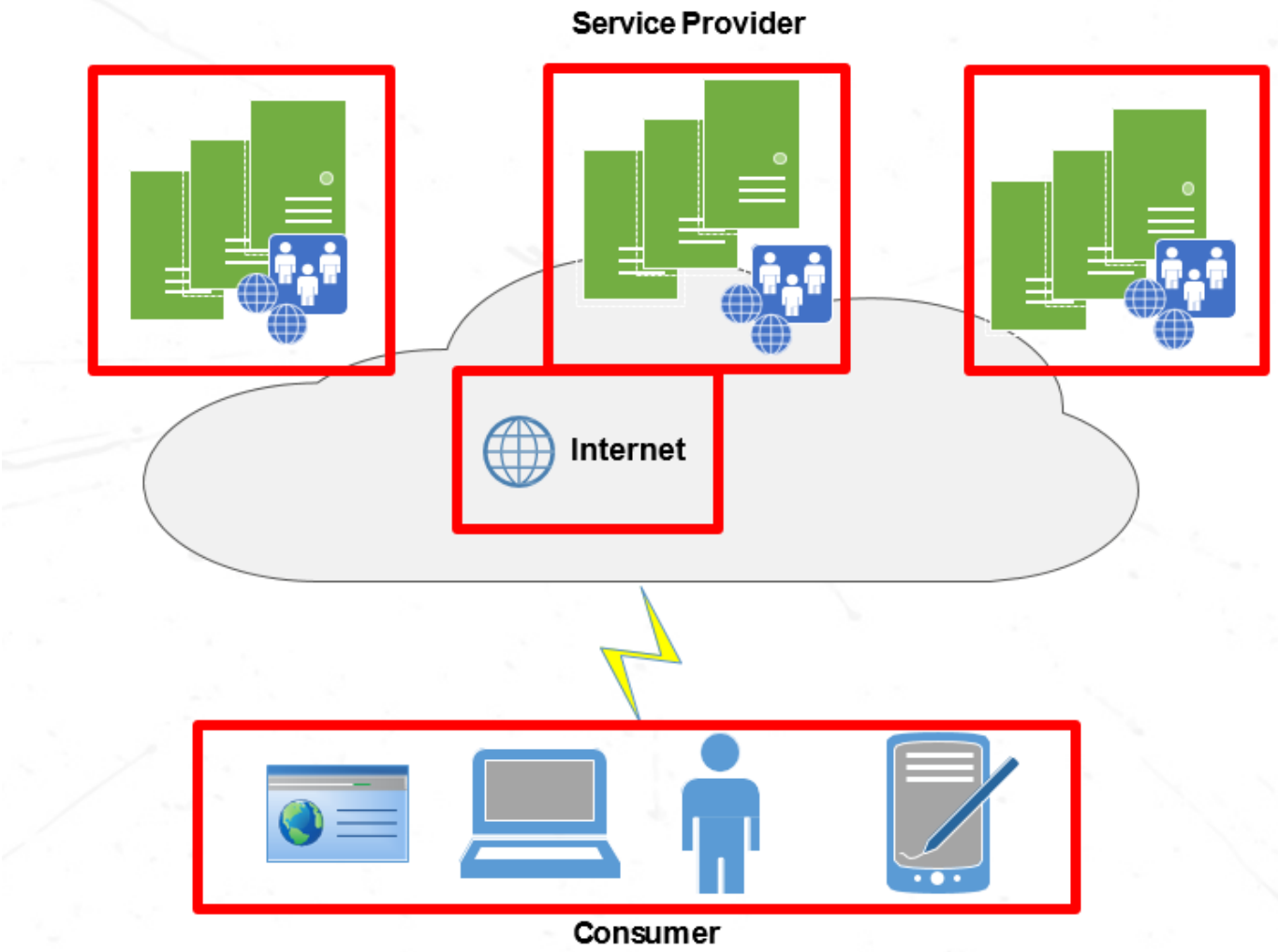
Attraverso la virtualizzazione, le risorse che una volta erano disponibili solo in forma fisica, come server, dispositivi di storage o sistemi desktop, vengono astratte in forma digitale. La tecnologia separa l'hardware fisico dal software in esecuzione su di esso.

Un livello software chiamato hypervisor consente la virtualizzazione.

Questo software astrae le risorse del suo sistema host, che si tratti di CPU, GPU, memoria, storage o larghezza di banda di rete per allocarle in modo dinamico tra un numero di risorse virtuali in esecuzione sul sistema in base alle richieste di risorse ricevute.

Ogni Risorsa Virtuale viene eseguita come singolo file di dati sul sistema host e può essere facilmente spostata da un sistema all'altro e funziona allo stesso modo quando viene riaperta.

Cloud



Cloud Infrastructure Models

Public

All services exist in the Internet

Multi-tenancy

Private

All services exist in the private network

Hybrid

Private connection between public and private clouds

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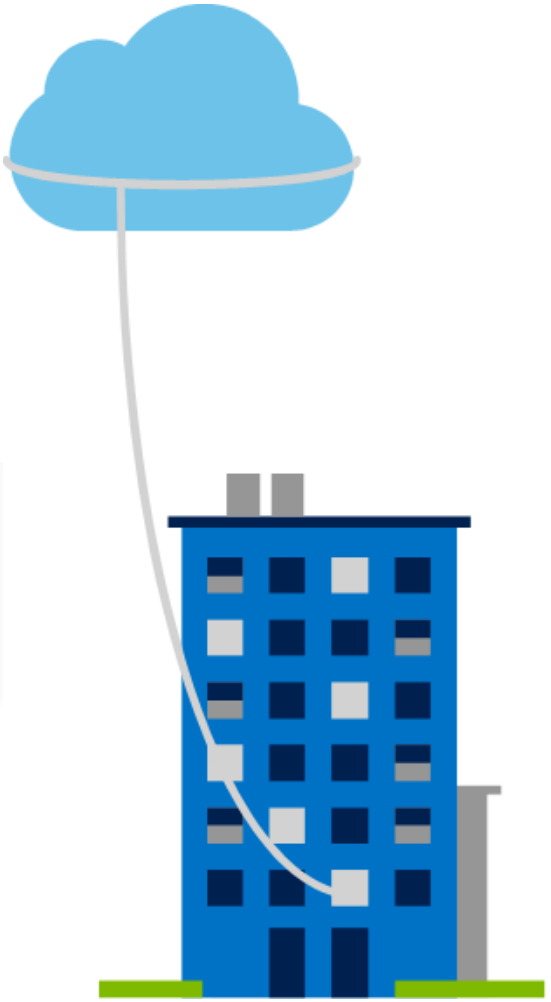
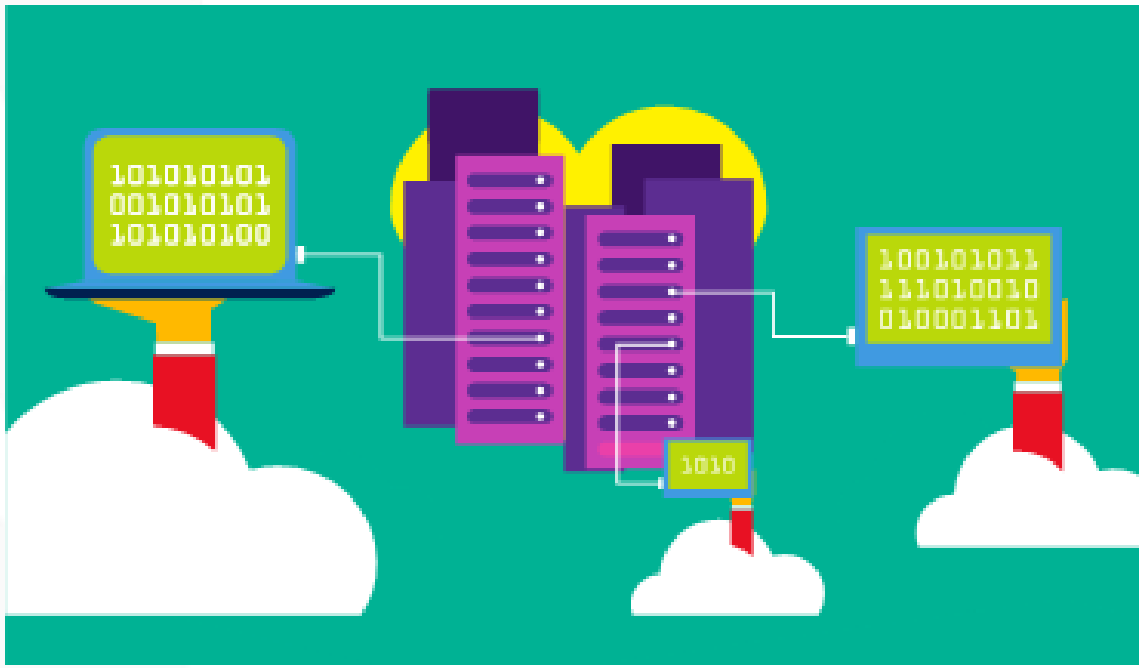
Private cloud

- Organizations create a cloud environment in their datacenter.
- Organization is responsible for operating the services they provide.
- Does not provide access to users outside of the organization.



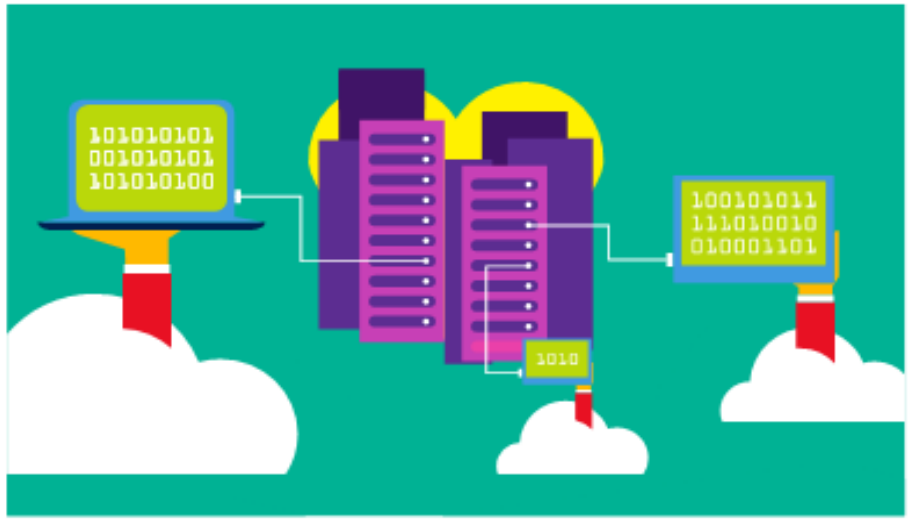
Public cloud

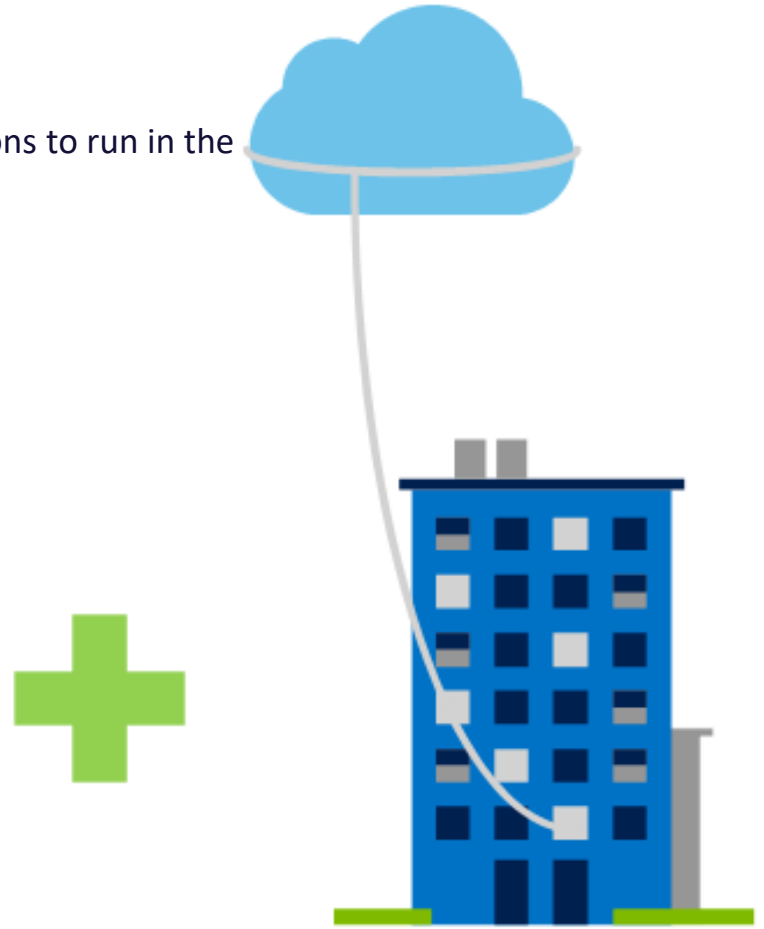
- Owned by cloud services or hosting provider.
- Provides resources and services to multiple organizations and users.
- Accessed via secure network connection (typically over the internet).



Hybrid cloud

Combines **Public** and **Private** clouds to allow applications to run in the most appropriate location.





Cloud model comparison

Public Cloud	• 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.

Cloud Models

SaaS

Software-as-a-service (es: Office 365)

PaaS

Platform-as-a-service (es: Database)

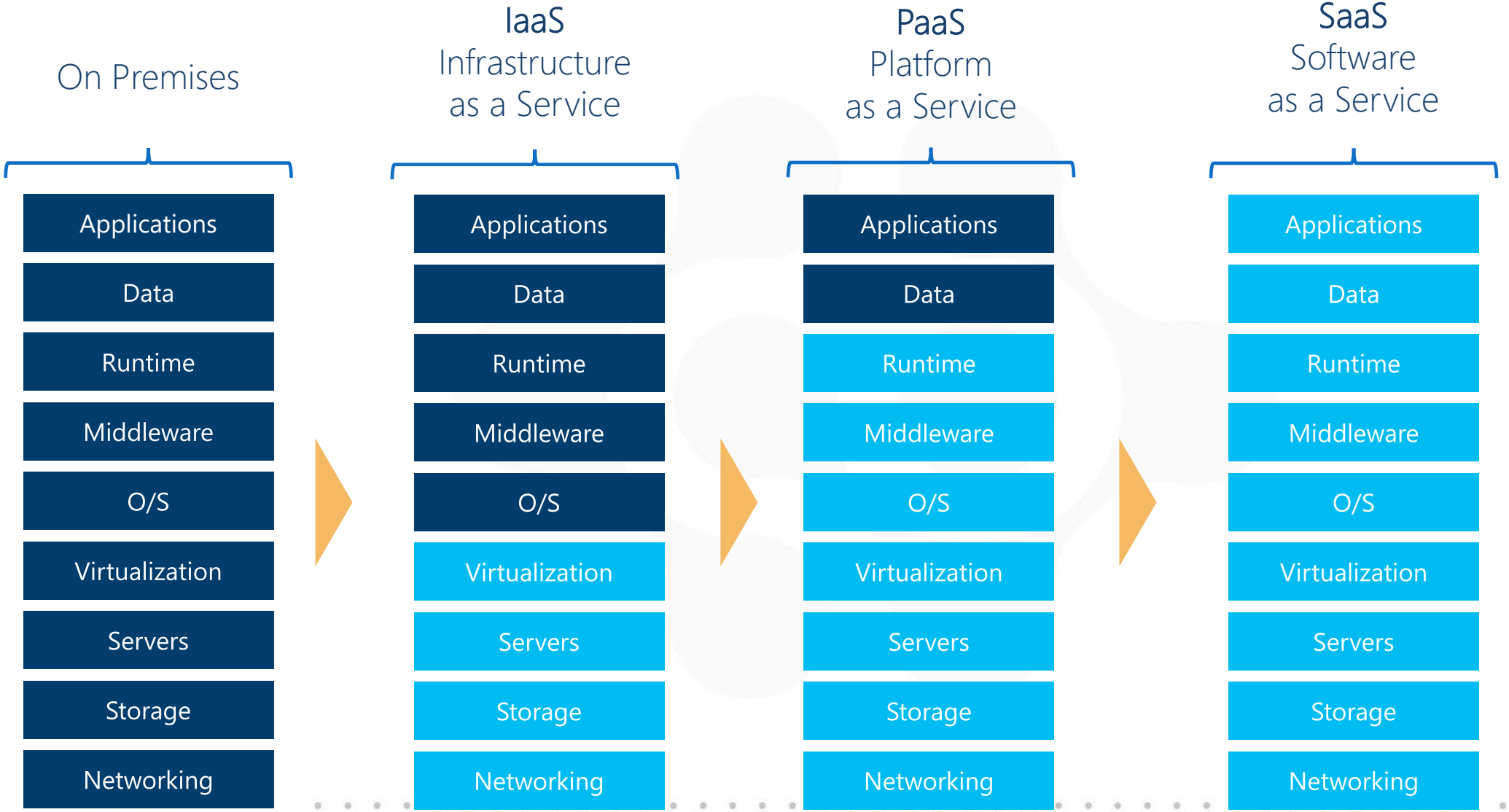
IaaS

Infrastructure-as-a-service (es: Macchine Virtuali)

Cloud Models

Managed by You

Managed by Cloud Provider



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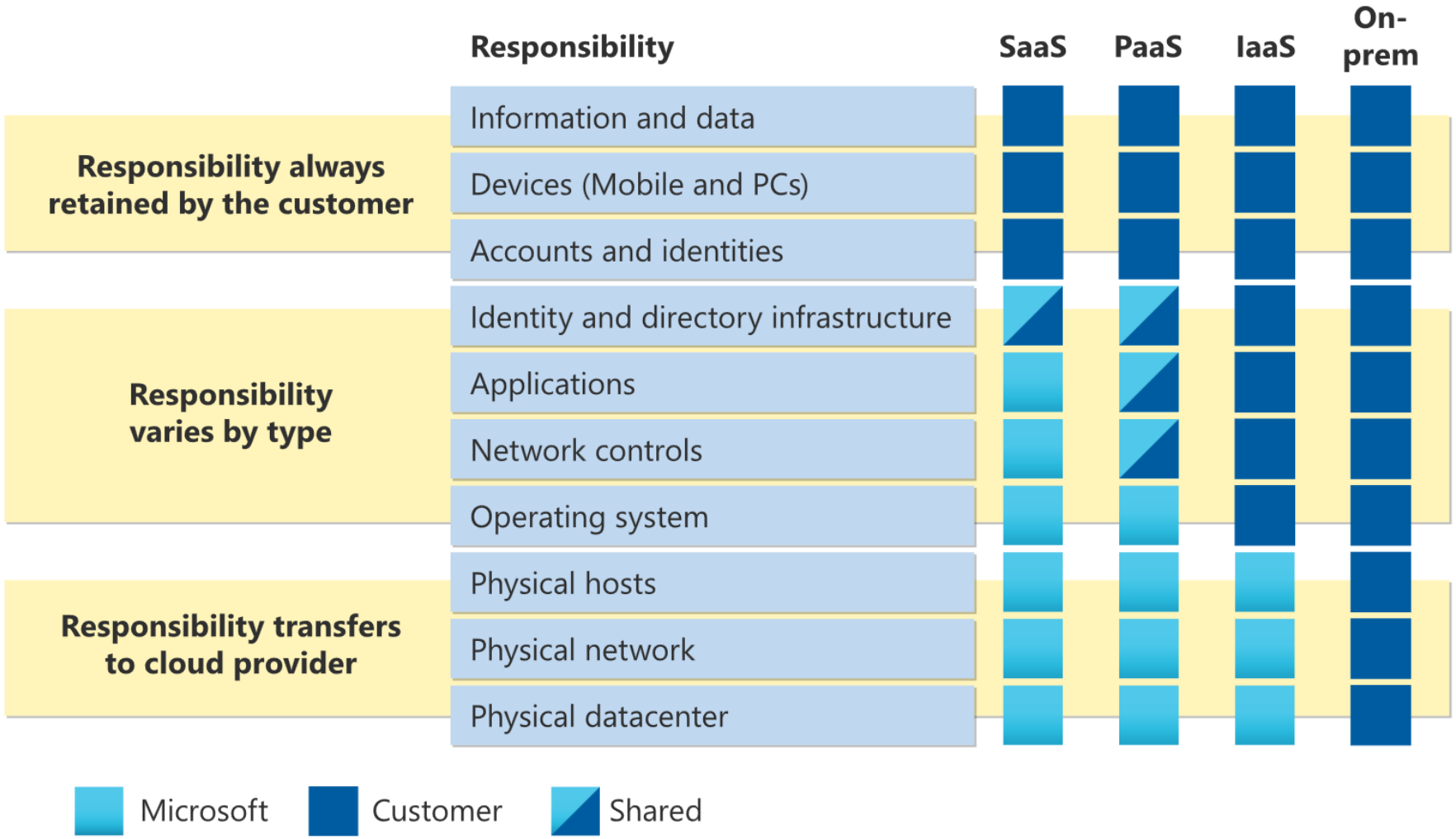
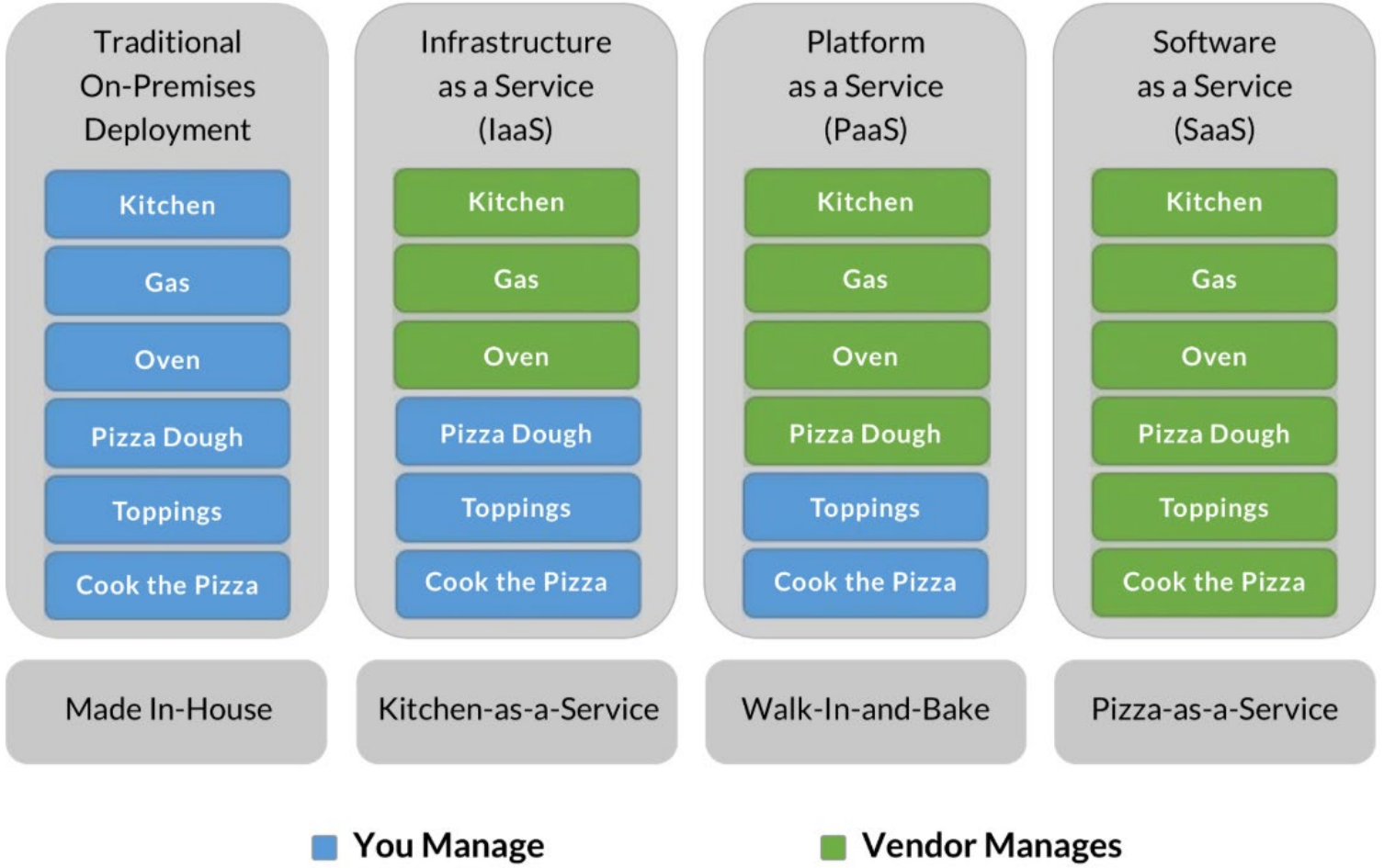
Shared responsibility model



On Premise, IAAS, PAAS,SAAS: pizza Examples ;-)



https://m.oursky.com/saas-paas-and-iaas-explained-in-one-graphic-d56c3e6f4606

Cloud Benefits

- High availability
- Elasticity
- Scalability
- Reliability
- Predictability
- Security
- Governance
- Manageability
- speed of deployment

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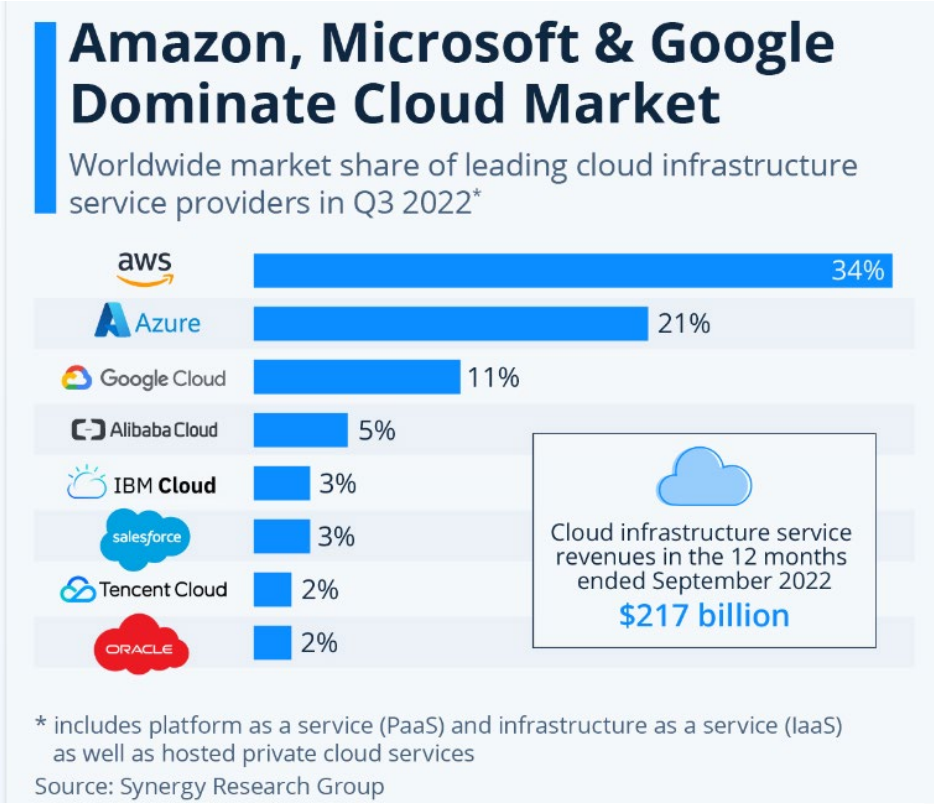
Cloud Market



Microsoft Azure

amazon web services

Il ritmo di crescita di Azure è maggiore rispetto a quella di AWS

https://www.statista.com/chart/18819/worldwide-market-share-of-leading-cloud-infrastructure-service-providers/

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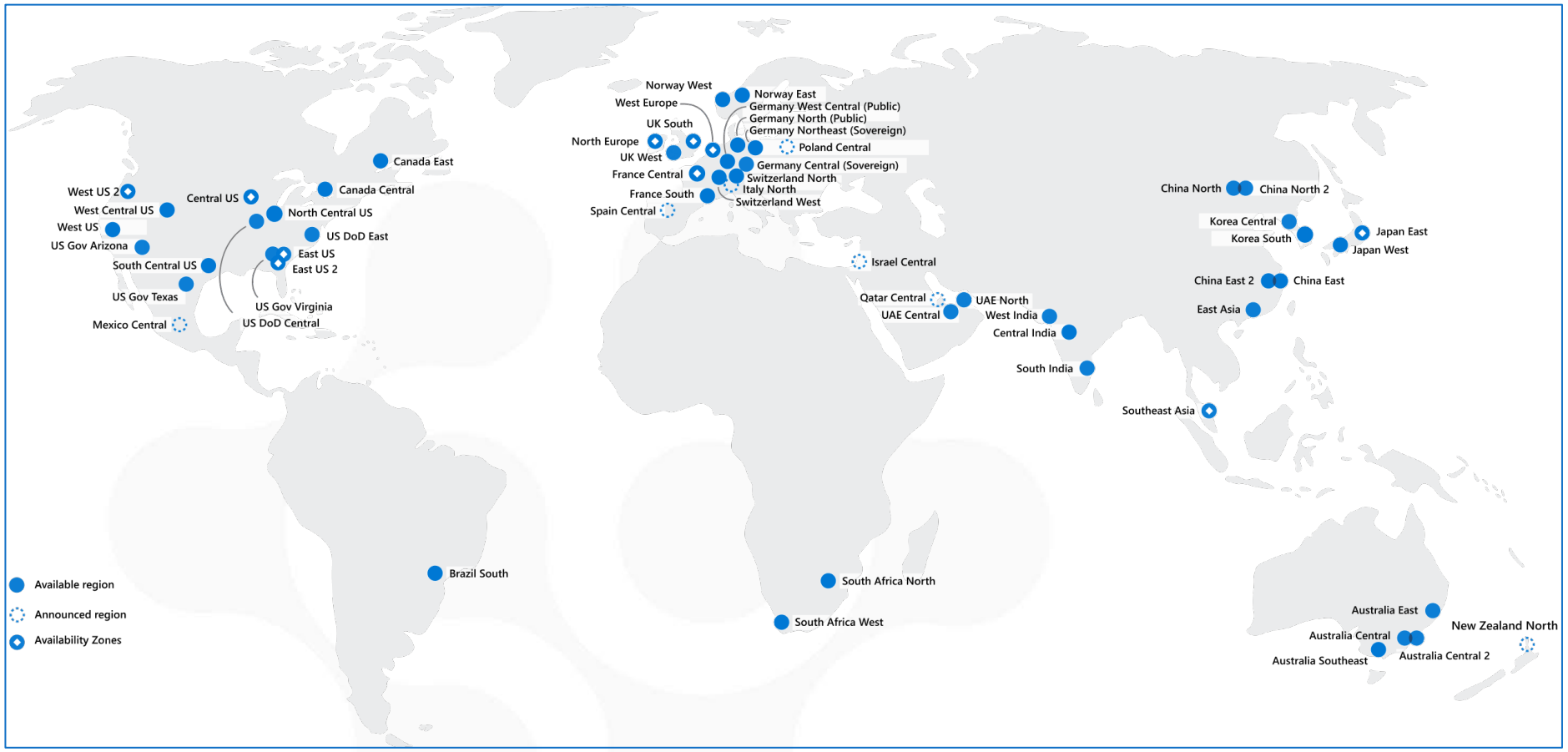
Azure

Regions

- Regions are made up of one or more datacentres in close proximity.
- Provide flexibility and scale to reduce customer latency.
- Preserve data residency with a comprehensive compliance offering.



Azure offers more global regions than any other cloud provider with 60+ regions representing over 140 countries

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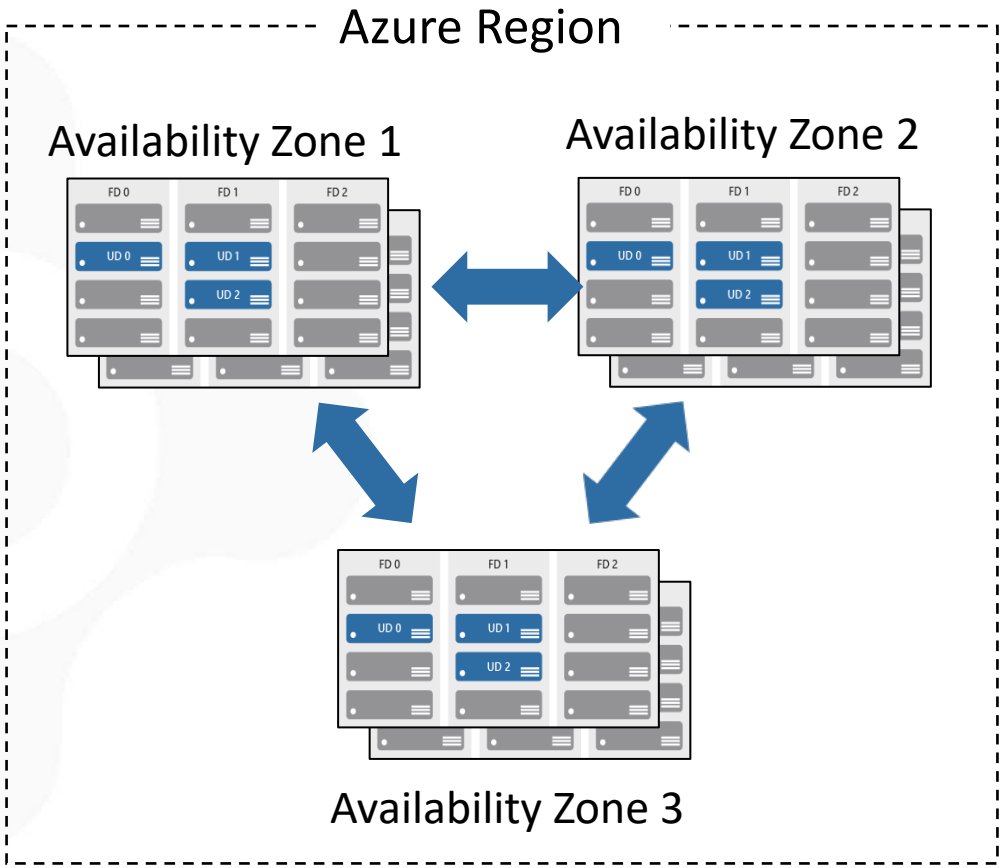
Availability zones

- Provide protection against downtime due to datacenter failure.
- Physically separate datacenters within the same region.
- Each datacenter is equipped with independent power, cooling, and networking.
- Connected through private fiber-optic networks.



Region Pairs

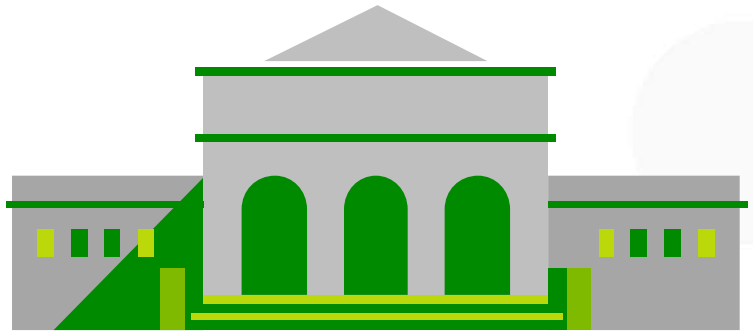
- At least 300 miles of separation between region pairs.
- Automatic replication for some services.
- Prioritized region recovery in the event of outage.
- Updates are rollout sequentially to minimize downtime.

Web Link: https://aka.ms/PairedRegions

Region	Region
North Central US	South Central US
East US	West US
West US 2	West Central US
US East 2	Central US
Canada Central	Canada East
North Europe	West Europe
UK West	UK South
Germany Central	Germany Northeast
South East Asia	East Asia
East China	North China
Japan East	Japan West
Australia Southeast	Australia East
India South	India Central
Brazil South (Primary)	South Central US

Azure Sovereign Regions (US Government services)

Meets the security and compliance needs of US federal agencies, state and local governments, and their solution providers.



Azure Government:

- Separate instance of Azure.
- Physically isolated from non-US government deployments.
- Accessible only to screened, authorized personnel.

Azure Sovereign Regions (Azure China)

Microsoft is China's first foreign public cloud service provider, in compliance with government regulations.

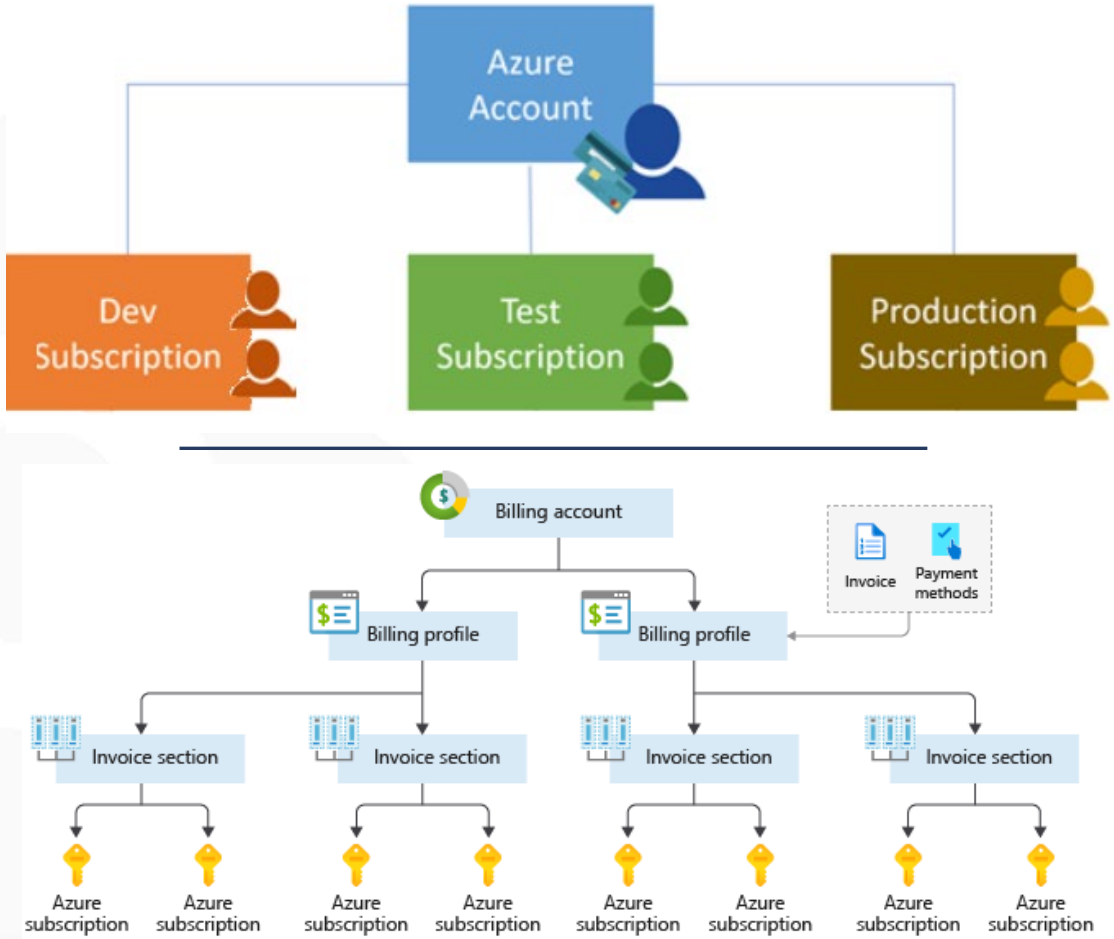
Azure China features:

- Physically separated instance of Azure cloud services operated by 21Vianet
- All data stays within China to ensure compliance

Azure Subscriptions

An Azure subscription provides you with authenticated and authorized access to Azure accounts.

- Billing boundary: generate separate billing reports and invoices for each subscription.
- Access control boundary: manage and control access to the resources that users can provision with specific subscriptions.



Tenants

Tenants ➔ Azure Active Directory

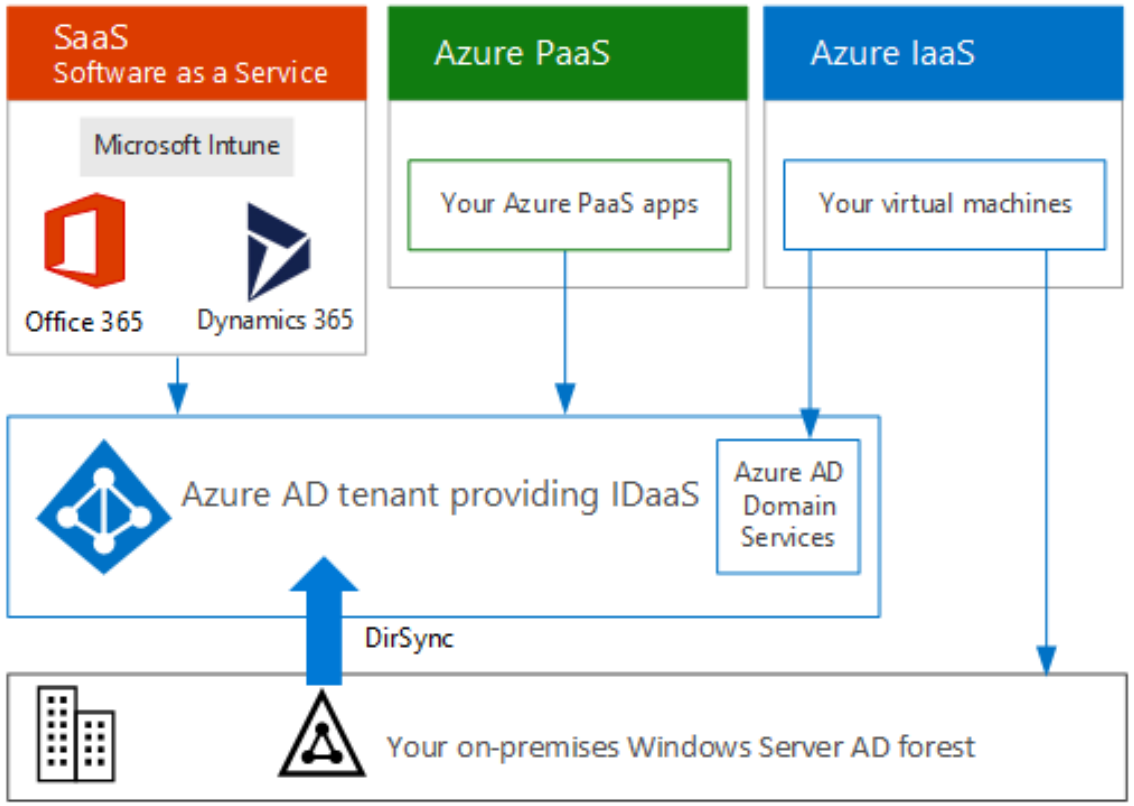
Organizzazione: ➔ uno o più Tenants

Tenant: ➔ una o più Sottoscrizioni

Sottoscrizione: ➔ uno o più User

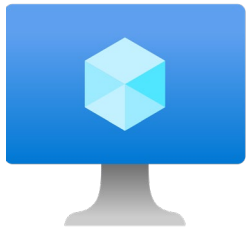
Il costo può essere:

- per User (office 365)
- per utilizzo risorsa (Azure)

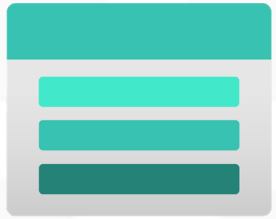


Azure Resources

Azure **resources** are components like storage, virtual machines, and networks that are available to build cloud solutions.



Virtual Machines



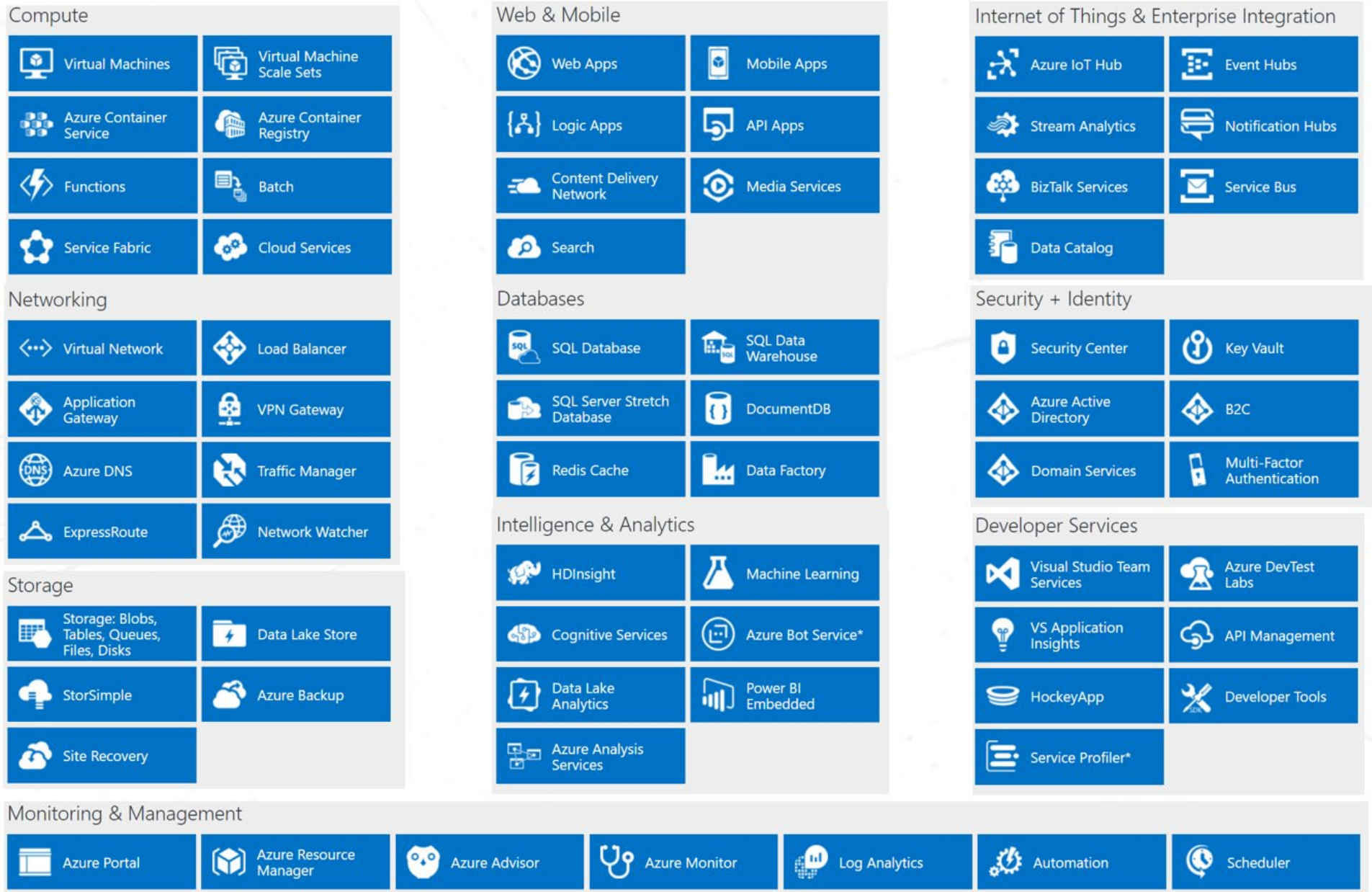
Storage Accounts

Virtual Networks

App Services

SQL Databases

Functions



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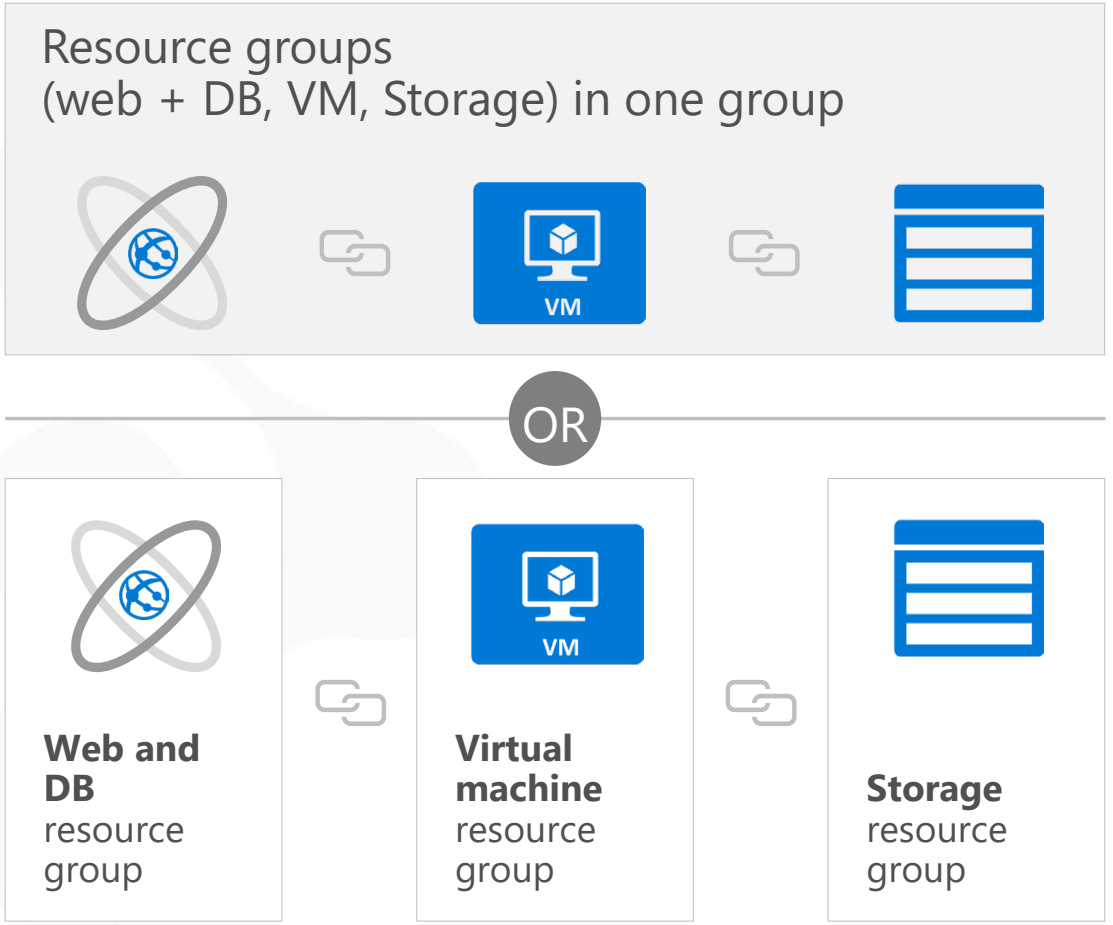
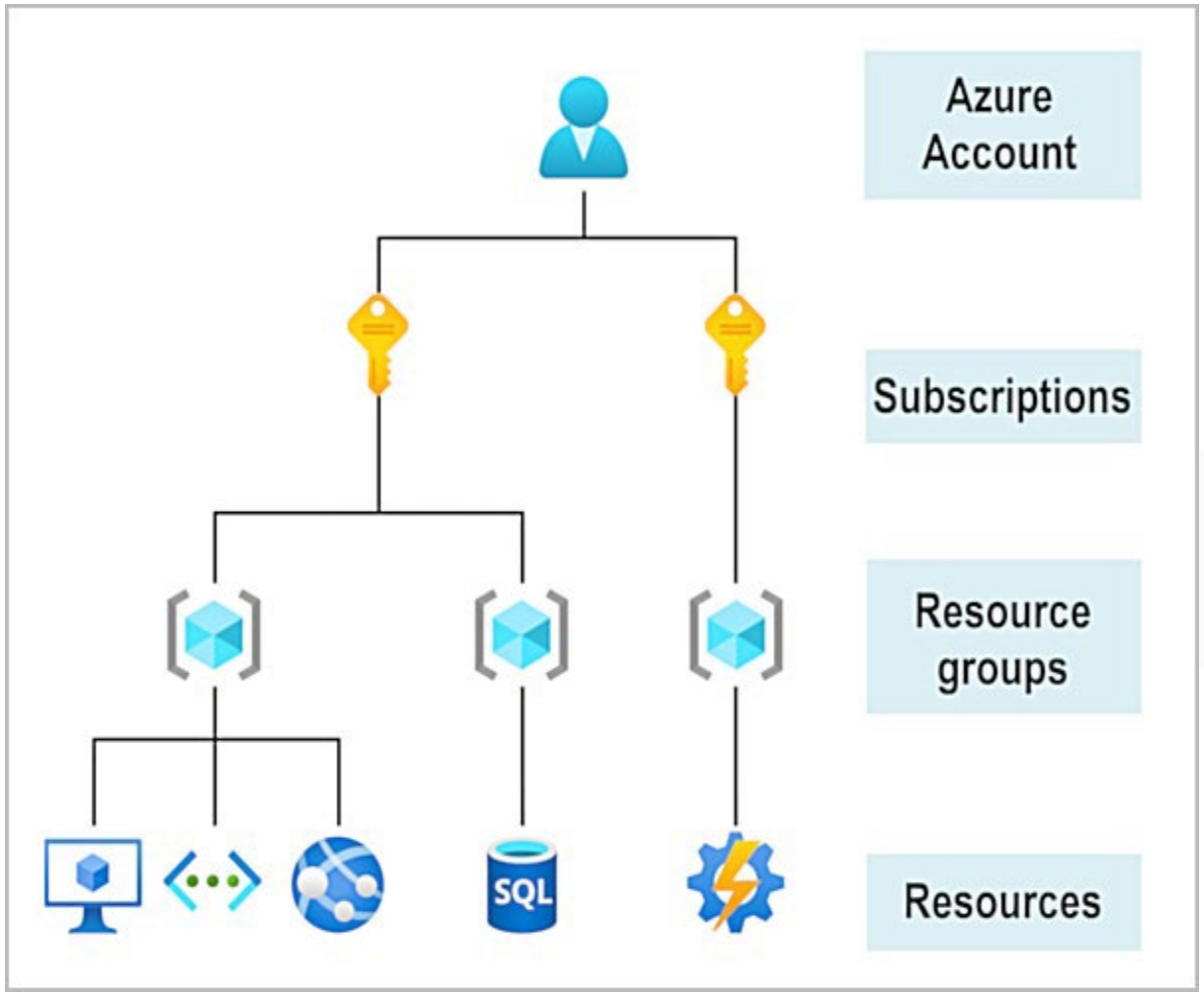
Resource groups

A **resource group** is a container to manage and aggregate resources in a single unit.

- Resources can exist in only one resource group.
- Resources can exist in different regions.
- Resources can be moved to different resource groups.
- Applications can utilize multiple resource groups.




Azure Account
Subscriptions
Resource groups
Resources
SQL

Costi

Il costo dipende da:

- “Potenza” della risorsa (capacità computazionale e dimensione di storage)

- “Durata” calacolata secondo vari modelli a seconda della risorsa implicata:

  - ✓ Proporzionale al tempo di esistenza della risorsa (Storage, *Azure Sql Database*)
  - ✓ Proporzionale al tempo di funzionamento della risorsa (Virtual Machine)
  - ✓ In funzione dell’attività computazionale richiesta (Azure Function)

Azure Resource Manager

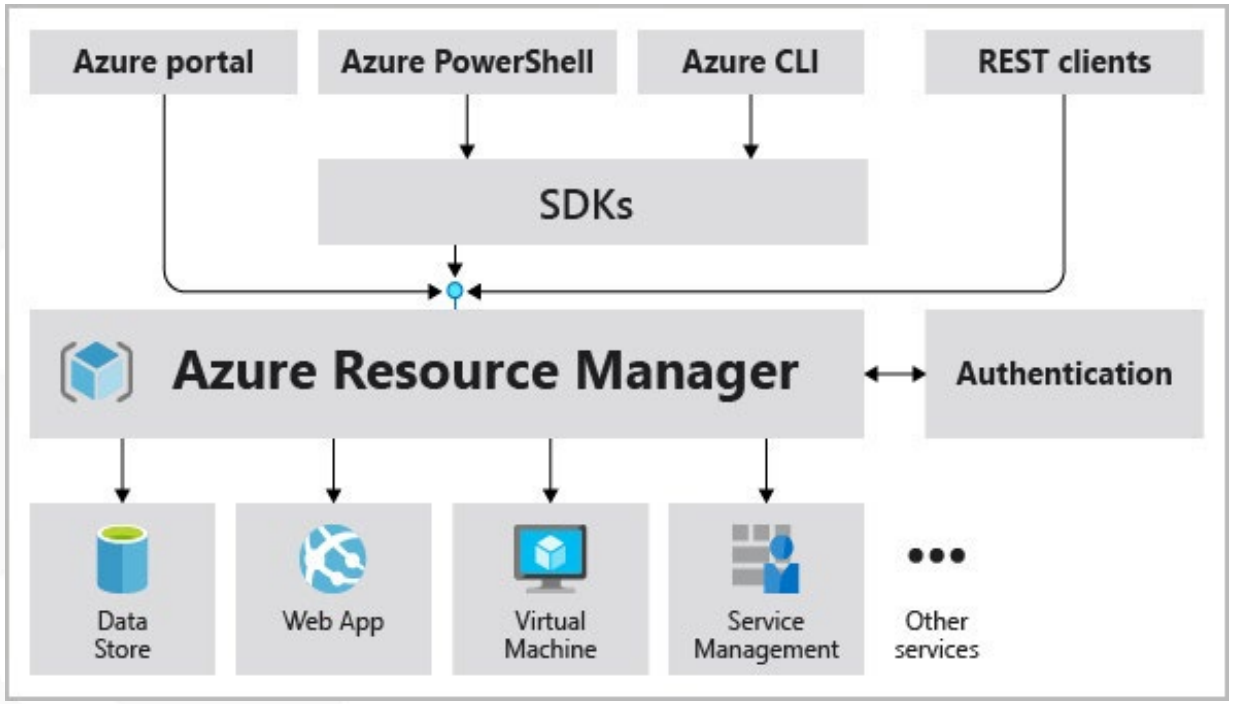
Azure Resource Manager is the deployment and management service for Azure.

When a user sends a request from any of the Azure tools, APIs, or SDKs, Resource Manager receives the request.

It authenticates and authorizes the request.

Resource Manager sends the request to the Azure service, which takes the requested action.

Because all requests are handled through the same API, you see consistent results and capabilities in all the different tools.



Link

https://azure.microsoft.com/it-it/explore/

https://azure.microsoft.com/it-it/explore/global-infrastructure/

https://infrastructuremap.microsoft.com/

https://infrastructuremap.microsoft.com/explore (il mappamondo)

Pricing Calculator | Microsoft Azure

portal.azure.com

https://learn.microsoft.com/en-us/certifications/exams/az-900