Cloud Computing

.NET CORE

Cloud computing is the delivery of computing services (servers, storage, databases, networking, software, analytics, intelligence) over the Internet ("the cloud") to offer faster innovation, flexible resources, and scalability.

HTTPS://AZURE.MICROSOFT.COM/EN-US/OVERVIEW/WHAT-IS-CLOUD-COMPUTING/

Cloud Computing – Benefits

https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/#benefits

Three primary reasons why Cloud Computing is beneficial for businesses.

- Cost - Eliminate the expense of hardware and software, the inefficiencies of setting up data centers, electricity payments for power and cooling, and the hiring of additional IT experts for managing infrastructure. IT teams can be more productive while achieving more important business goals.
- Global ***Scaling*** and Speed – Reduce latency by running on a network of secure, updated datacenters that can be scaled elastically. This means applying more (or less) computing power, storage, or bandwidth right when it's needed, with just a few mouse clicks.
- Security – Gain access to the most robust security possible, helping protect your data, apps, and infrastructure from threats.

Scaling – Types

https://simplicable.com/new/cloud-scaling

Category	Explanation
Cloud Scaling	Allocating cloud computing resources (and paying for them) as you need them.
Vertical Scaling (Up or Down)	Moving to a larger or smaller instance or upgrading/downgrading your resources.
Horizontal Scaling (In or Out)	Adding or removing instances to a service, system, or application

Important Terms

https://en.wikipedia.org/wiki/Service-level_agreement
https://cloud.google.com/docs/geography-and-regions

Term	Definition
SLA (Service Level Agreement)	A commitment between a service provider and a client about the quality and availability of service and the responsibilities of each party.
Regions	Independent geographic areas that consist of zones. Locations within regions usually have minimum round-trip network latencies.
Accessibility Zone	A deployment area for cloud resources within a region. Zones should be considered a single failure domain within a region. Applications should be deployed across multiple zones in a region to have higher availability.

Cloud Computing – Types

https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/#cloud-deployment-types

Public Cloud	Private Cloud	Hybrid Cloud
• Owned and operated by third-party cloud service providers. • Microsoft Azure, AWS*, and GCP** are public cloud services. • All hardware, software, etc, is owned and managed by the cloud provider. • Clients access these services and manage their accounts using a web browser.	• Used exclusively by a single organization. • Can be physically located at the company's on-site datacenter. • Some companies also contract to third-party service providers to host their private cloud off-site. • Services and infrastructure are maintained on a private network.	• Public cloud and either private and/or on-site clouds combined. • Bound together by technology that allows data and applications to be shared between them. • Gives businesses greater flexibility, more deployment options, and helps optimize existing infrastructure, security, and compliance.

*Amazon Web Services
**Google Cloud Platform

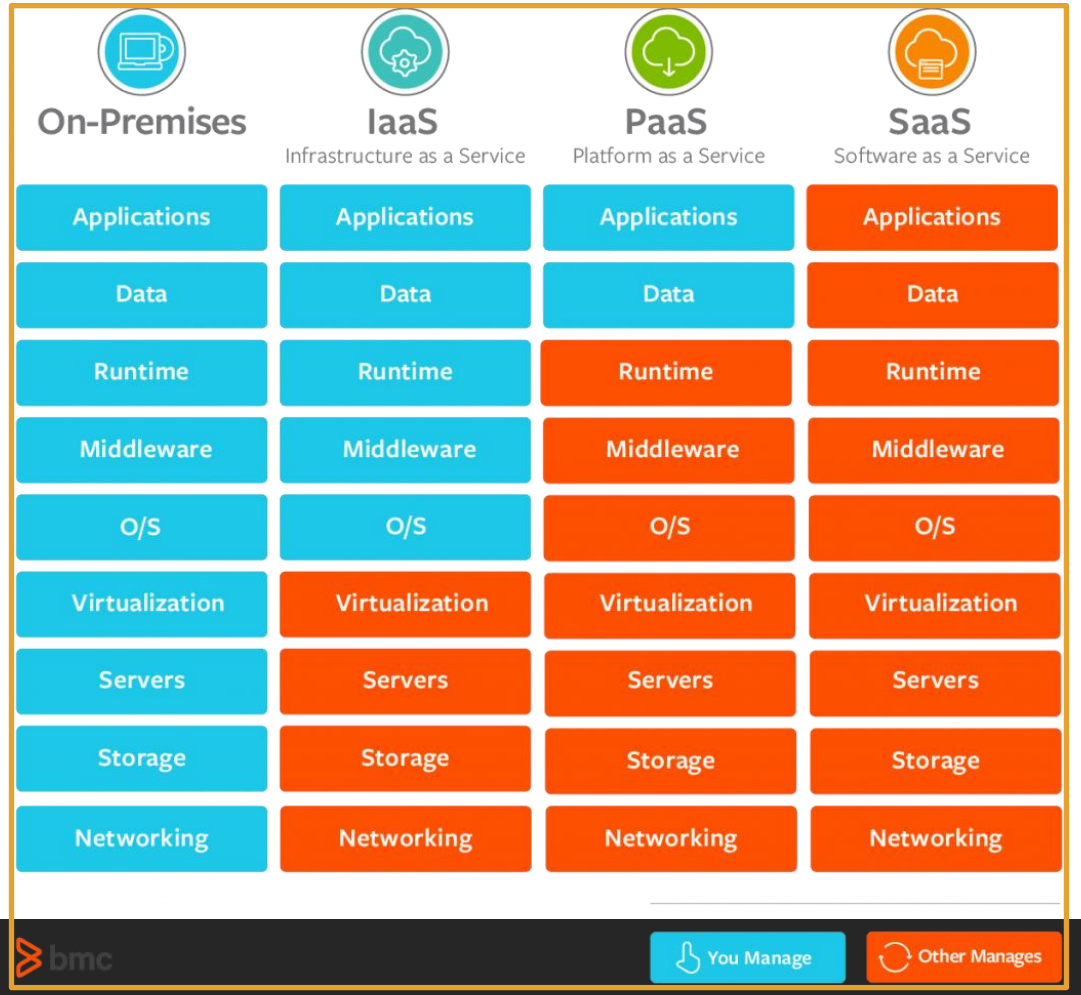
Cloud Computing Services – Models

https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/#cloud-computing-models

Most cloud computing services fall into three broad categories:

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)

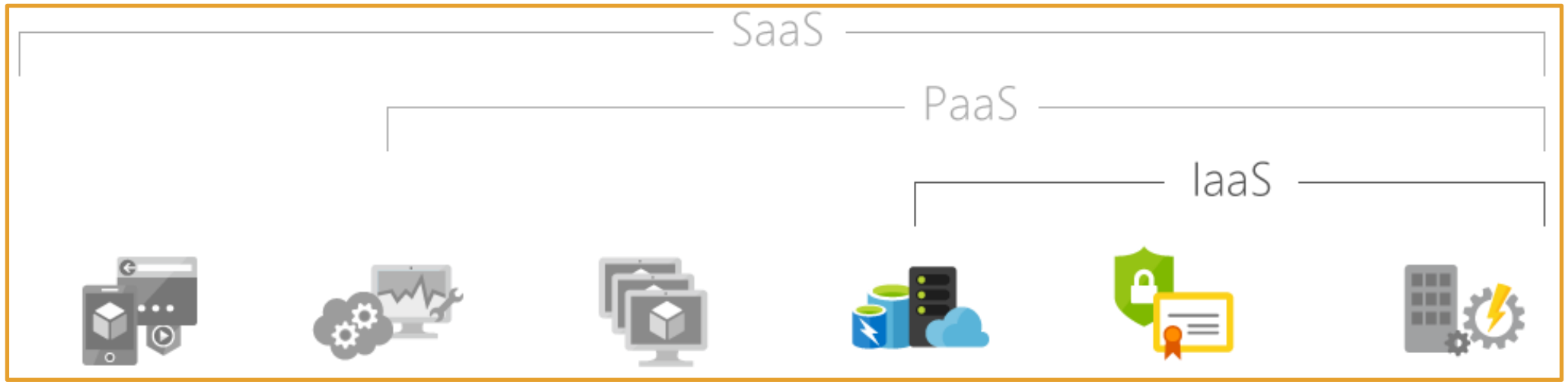
These are sometimes called the cloud computing "stack" because they build on top of one another.



IaaS (Infrastructure as a Service)

https://azure.microsoft.com/en-us/overview/what-is-iaas/

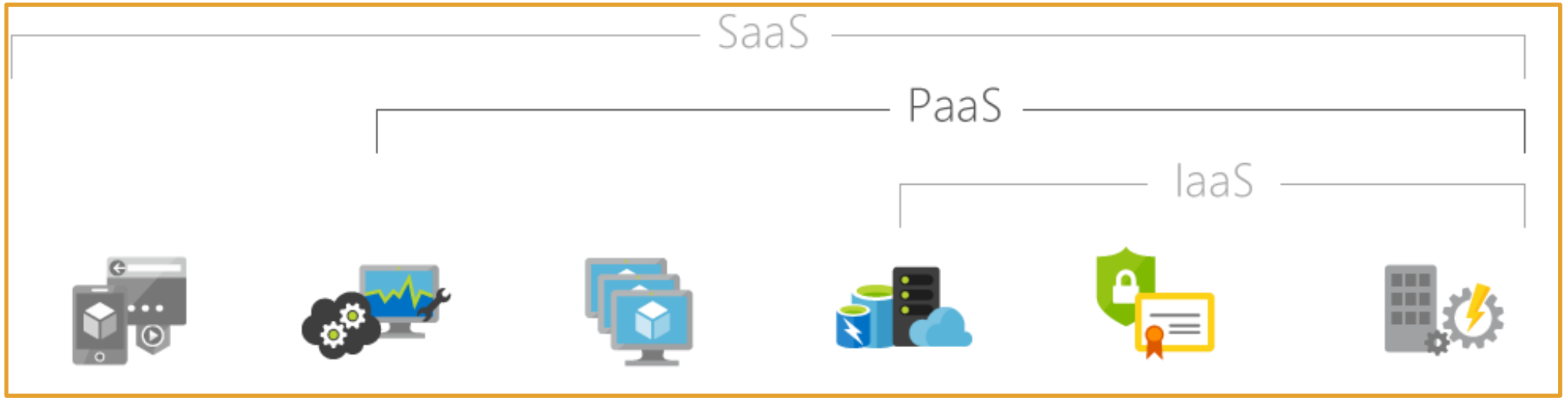
With ***IaaS***, you rent IT infrastructure (servers and virtual machines (VMs), storage, networks, operating systems) from a cloud provider on a pay-as-you-go basis. ***IaaS*** quickly scales up and down with demand. ***IaaS*** helps you avoid the expense and complexity of buying and managing your own physical servers and other datacenter infrastructure. Each resource is offered as a separate service component, and you only need to rent one for as long as you need it.



PaaS (Platform as a Service)

https://azure.microsoft.com/en-us/overview/what-is-paas/

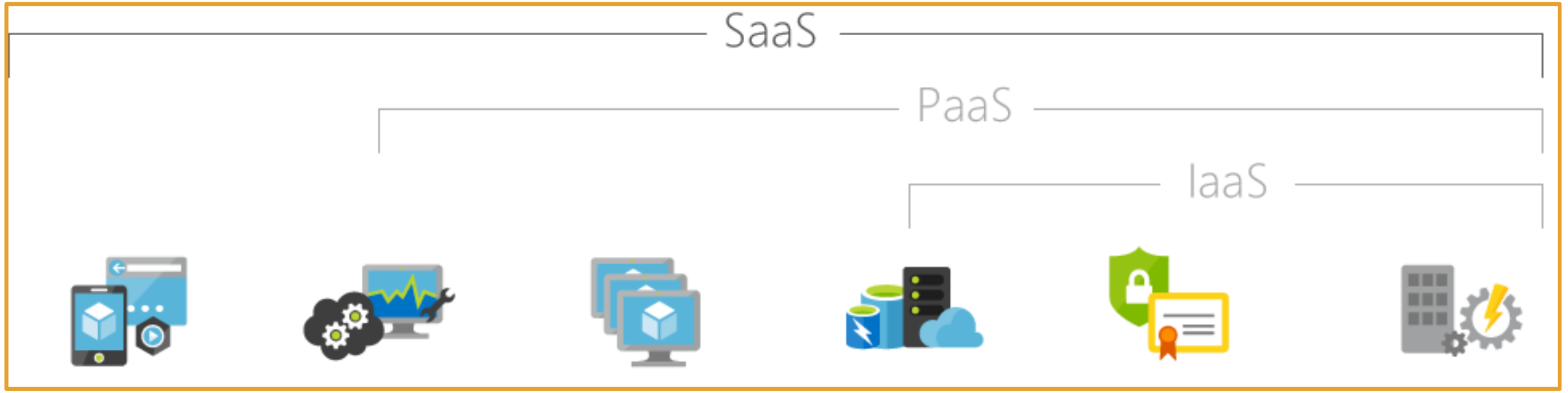
PaaS is a complete development and deployment environment in the cloud. PaaS refers to cloud computing services that supply an on-demand environment for developing, testing, delivering, and managing software applications. ***PaaS*** is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network, and databases needed for development.



SaaS (Software as a Service)

https://azure.microsoft.com/en-us/overview/what-is-saas/

SaaS is a method for delivering software applications over the Internet, on demand and typically on a subscription basis. With ***SaaS***, cloud providers host and manage the software application and underlying infrastructure, and handle any maintenance, like software upgrades and security patching. Users simply connect to the application over the Internet.



Activity (Groups)

https://docs.google.com/presentation

Create a ***Google Slides*** or ***PPT*** presentation.

1. In your own words, explain the three different types of Services.
2. Give at least 1 example of a real-life situation using each type of service.
3. Explain WHY that service is best for each situation.
4. Explain which type of cloud (private, public, hybrid) is best for each situation.
5. Identify a service offered by MS Azure, AWS, GCP, etc, that would fall under the service and cloud type of each of your three use cases.

*Each group member must present equivalent numbers of slides.

*Each team will be limited to 5 minutes so practice fitting your entire presentation to that timeframe.