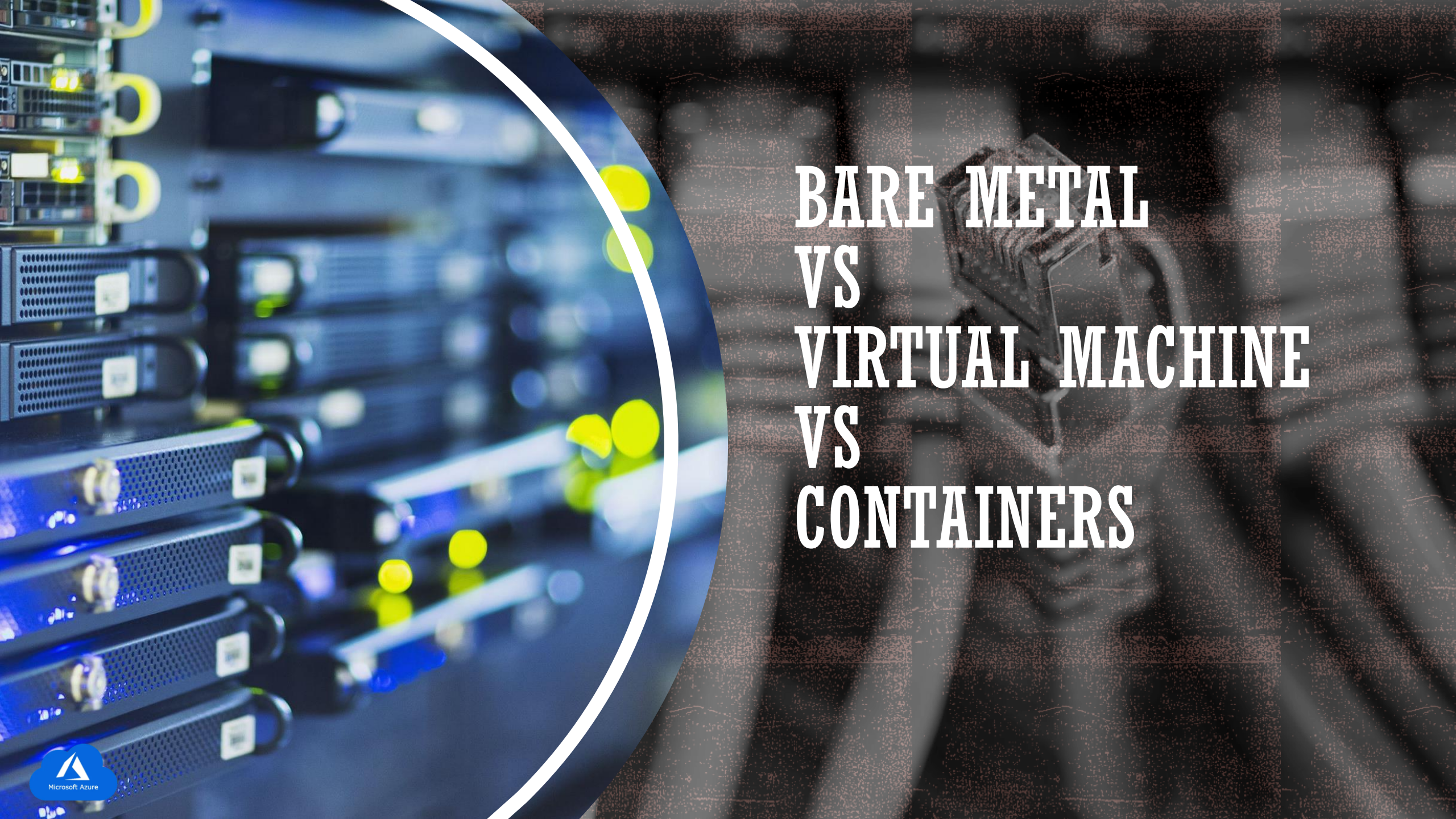
COMPUTE FUNDAMENTALS

Manoj Bhargavan

Microsoft Azure


BARE METAL
VS
VIRTUAL MACHINE
VS
CONTAINERS
Microsoft Azure

TRADITIONAL COMPUTER

Applications & Utilities

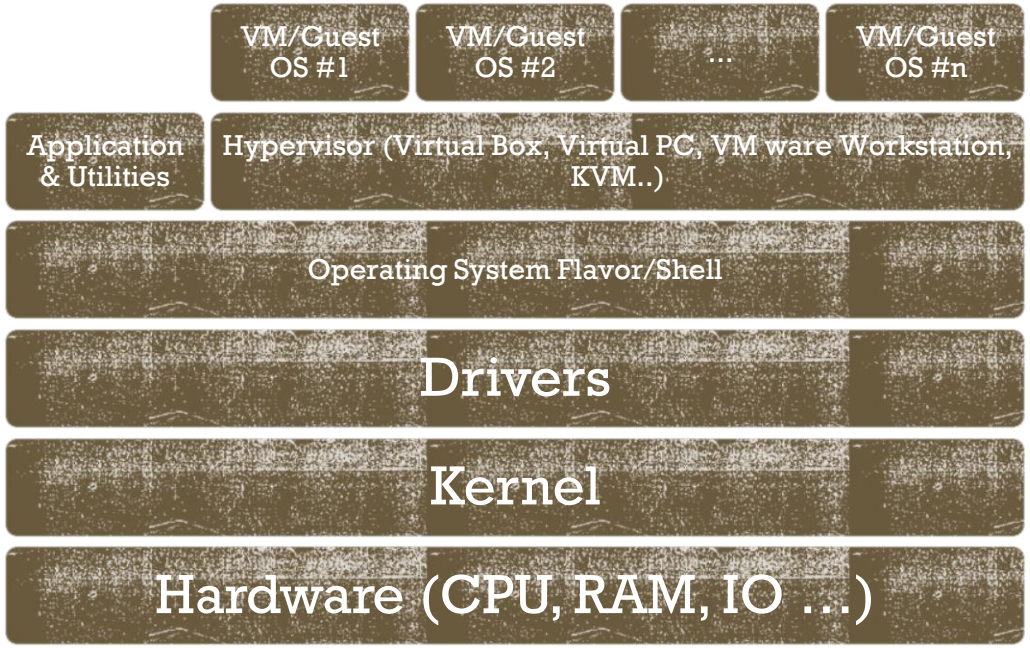
Operating System Flavor/Shell

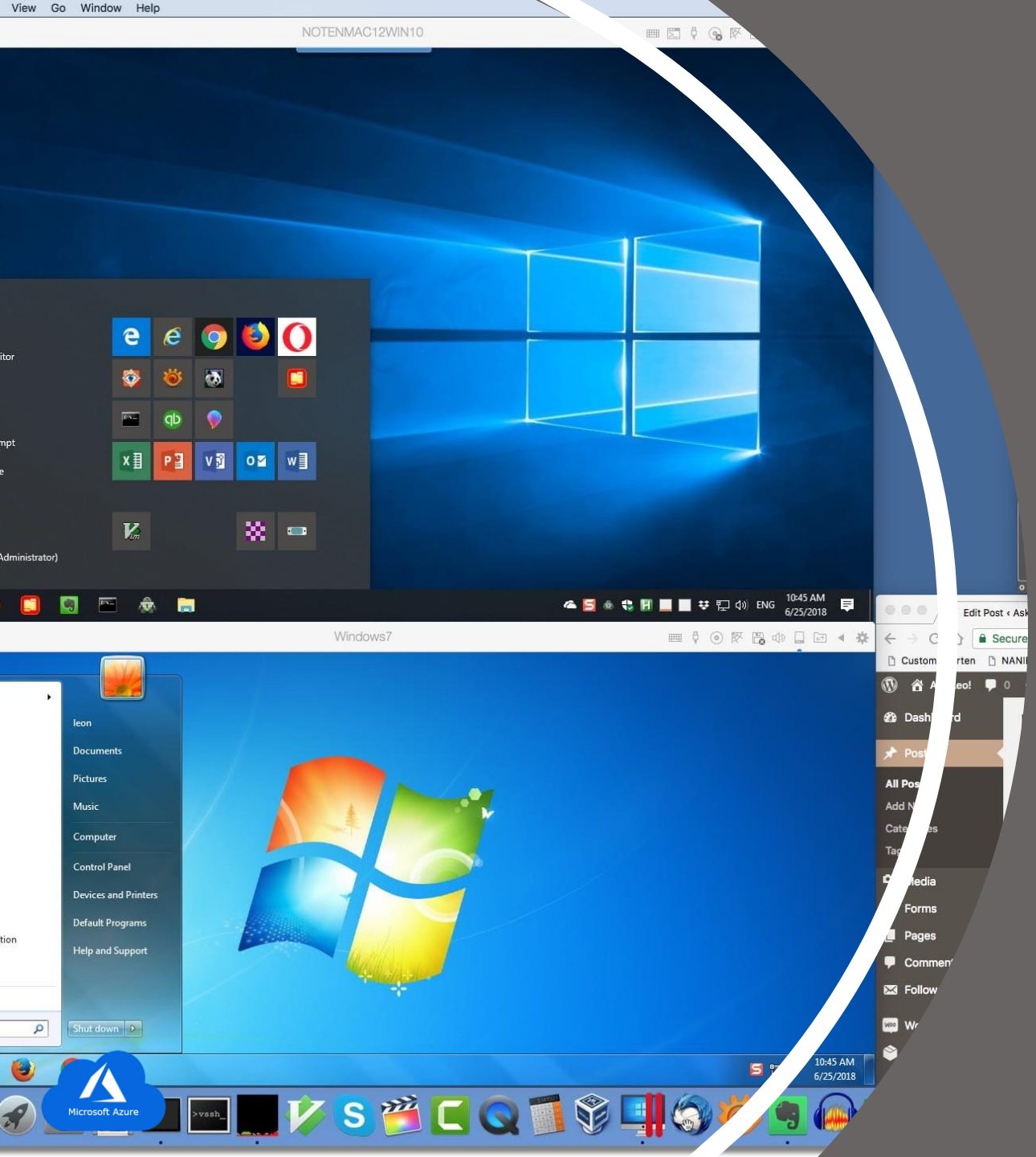
Drivers

Kernel

Hardware (CPU, RAM, IO …)

VIRTUAL MACHINE / HOSTED HYPERVISOR





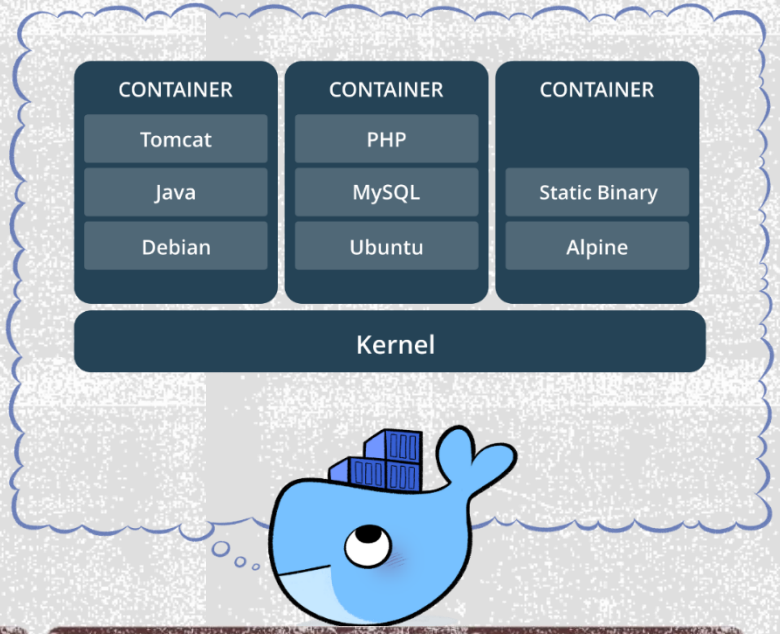
VIRTUAL MACHINE / BARE-METAL OR NATIVE HYPERVISOR

VM/Guest OS #1	VM/Guest OS #2	…	VM/Guest OS #n

Hypervisor (Hyper-V, Xen, VMware ESX)

Hardware (CPU, RAM, IO …)

CONTAINERS



Application & Utilities

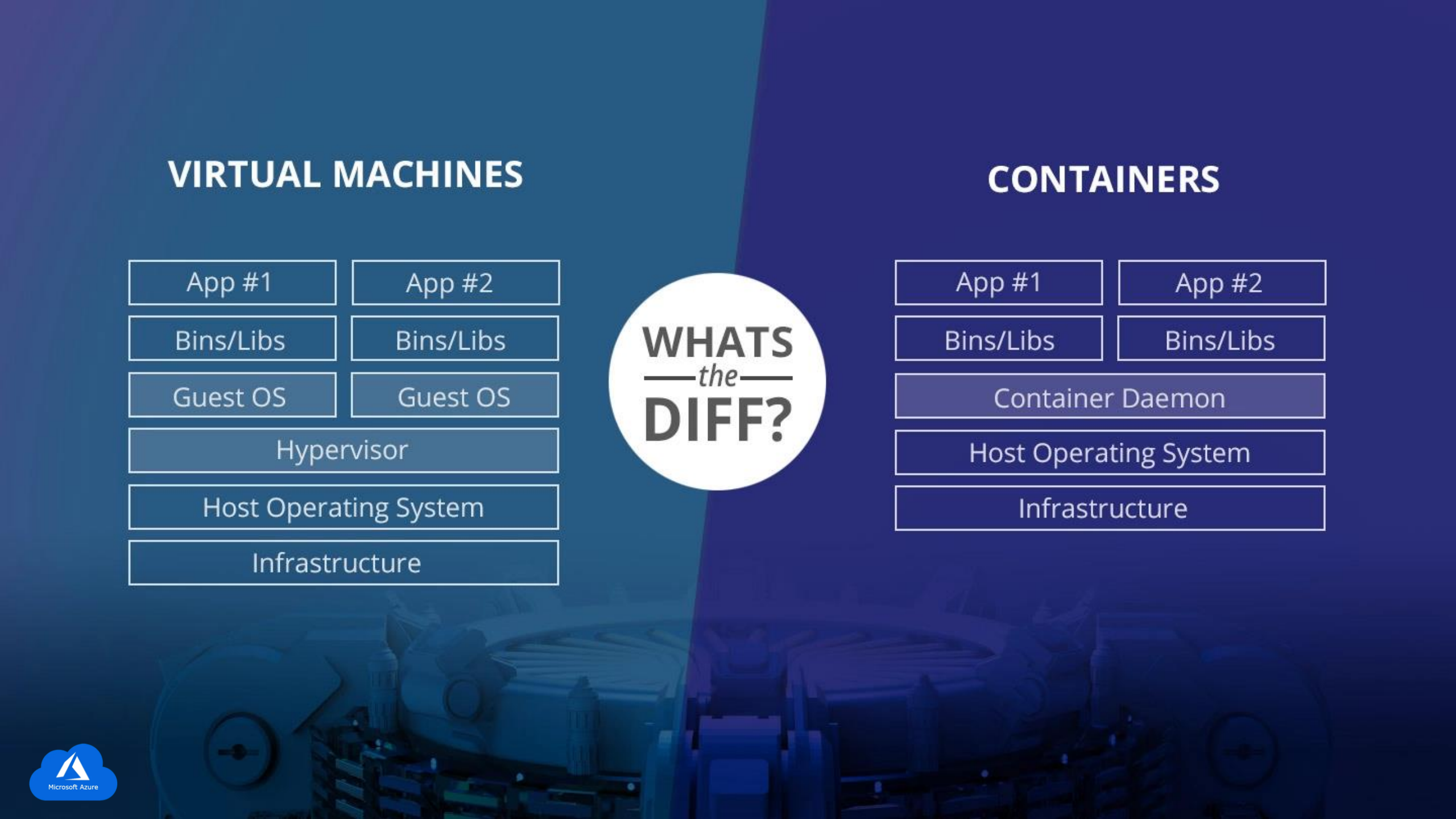
Container/Container Orchestration Software

Operating System Flavor/Shell

Drivers

Kernel

Hardware (CPU, RAM, IO …)


VIRTUAL MACHINES
App #1
App #2
Bins/Libs
Bins/Libs
Guest OS
Guest OS
Hypervisor
Host Operating System
Infrastructure
WHATS
the
DIFF?
CONTAINERS
App #1
App #2
Bins/Libs
Bins/Libs
Container Daemon
Host Operating System
Infrastructure
Microsoft Azure

THE CLOUD

Microsoft Azure

WHAT IS CLOUD

Microsoft Azure

BENEFITS OF CLOUD SERVICES

Availability - what percentage of time does a system respond properly to requests, expressed as a percentage over time *I.e. 99.99% availability implies up to 4 minutes per month of acceptable downtime*

High Availability - a system specifically designed to be resilient when some component of the system fails

Scalability - the ability of a system to grow its capacity "easily" when a system reaches its maximum capacity

Elasticity - the ability of a system to automatically grow when maximum capacity is reached, and automatically shrink to minimize waste

Agility - the ability to respond to change "rapidly" based on changes to market or Environment

Fault Tolerance - the ability to tolerate hardware failures in your system, required to achieve high availability

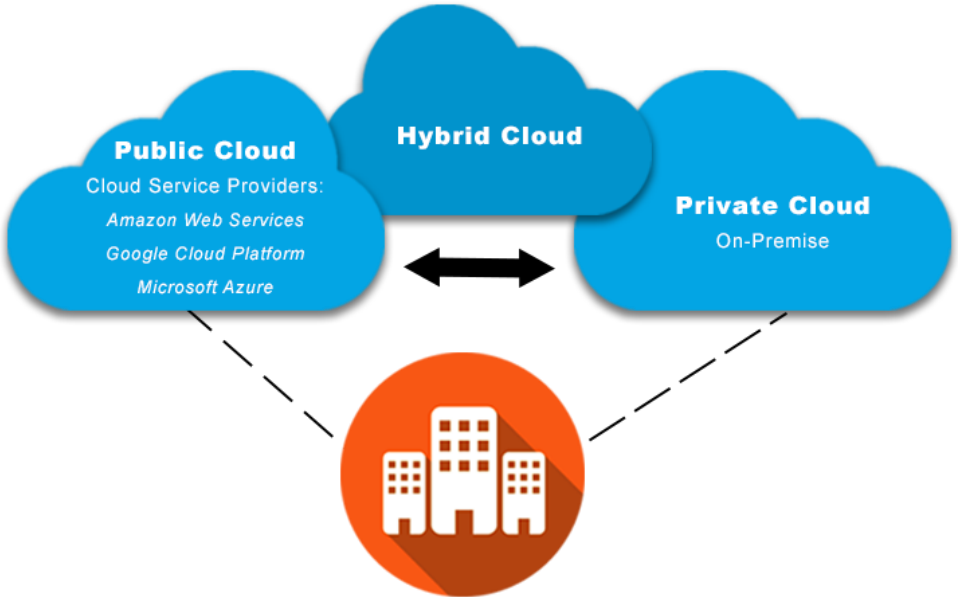
Disaster Recovery - the ability to recover from a big failure within an acceptable period, with an acceptable amount of data lost

Economies of Scale - the more you buy something, the cheaper it is per unit to buy; and the cheaper it is to maintain. M*icrosoft (and Google and AWS) can buy and run a server cheaper that you could ever possibly do yourself.*

Capital Expenditure (CapEx) - a (usually large) amount of money invested in an asset (building, computers, equipment) spent up front, and it returns profits slowly over time; major cash drain or loan required; cannot be deducted from your taxes in one year, depreciated over several years

Operating Expenditure (OpEx) - an amount of money spent "every month" as an operating expense; hopefully you earn more money in revenue from it than you spend; can be deducted from your taxes immediately; many accountants prefer OpEx over CapEx for the tax and cash flow benefits

Consumption-Based Model - paying for something based on how much you used, as opposed to paying for something no matter if you use it or not.



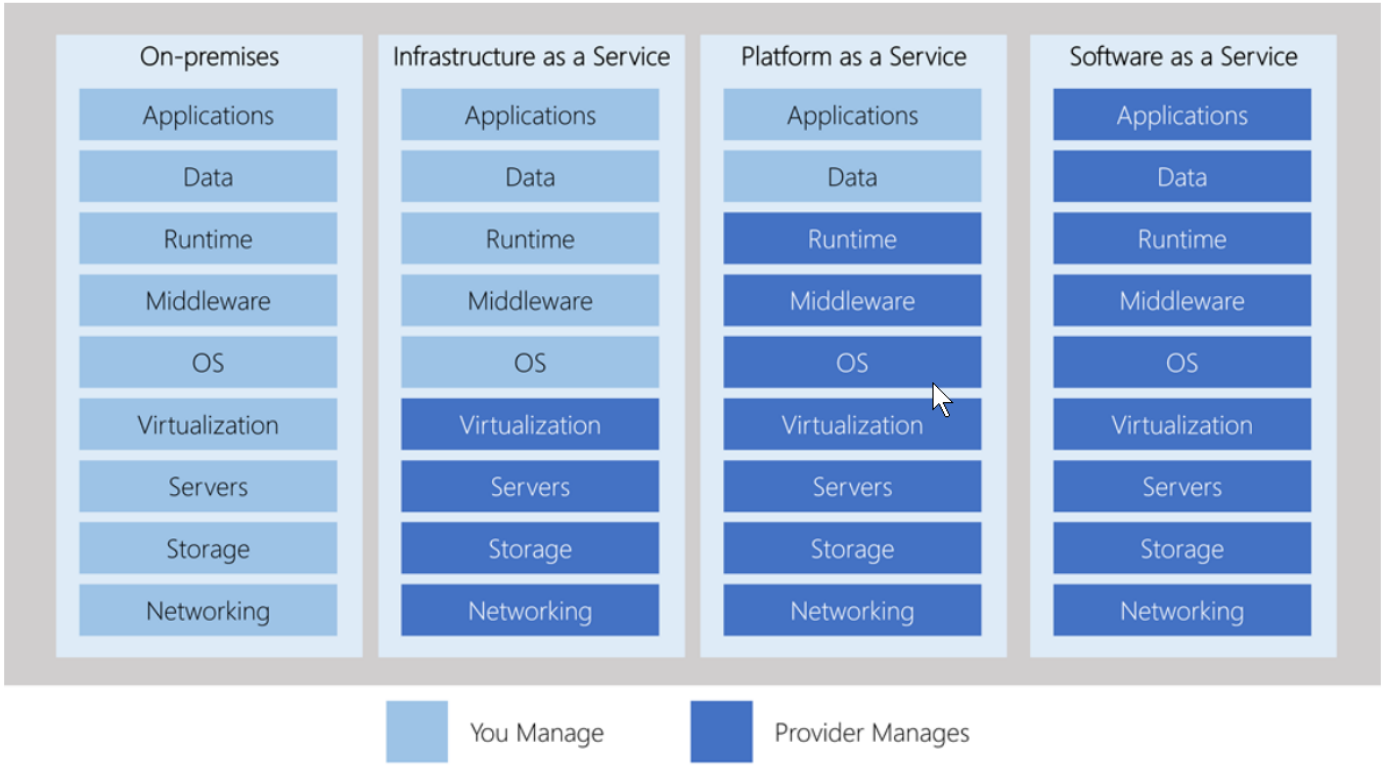
PUBLIC, PRIVATE AND HYBRID CLOUD

- **Public Cloud - Cloud services provided over the public Internet to anyone who wants to sign up for them.**

- **Private Cloud - Cloud services offered only to select users. This is sometimes called an "internal cloud". Looks and acts like a cloud computing but uses resources and servers available only to your company/organization.**

- **Hybrid Cloud - A mixture between your own private networks and servers and using the public cloud for some things. Typically used to take advantage of the unlimited, inexpensive growth benefits of the public cloud.**

CLOUD MODELS



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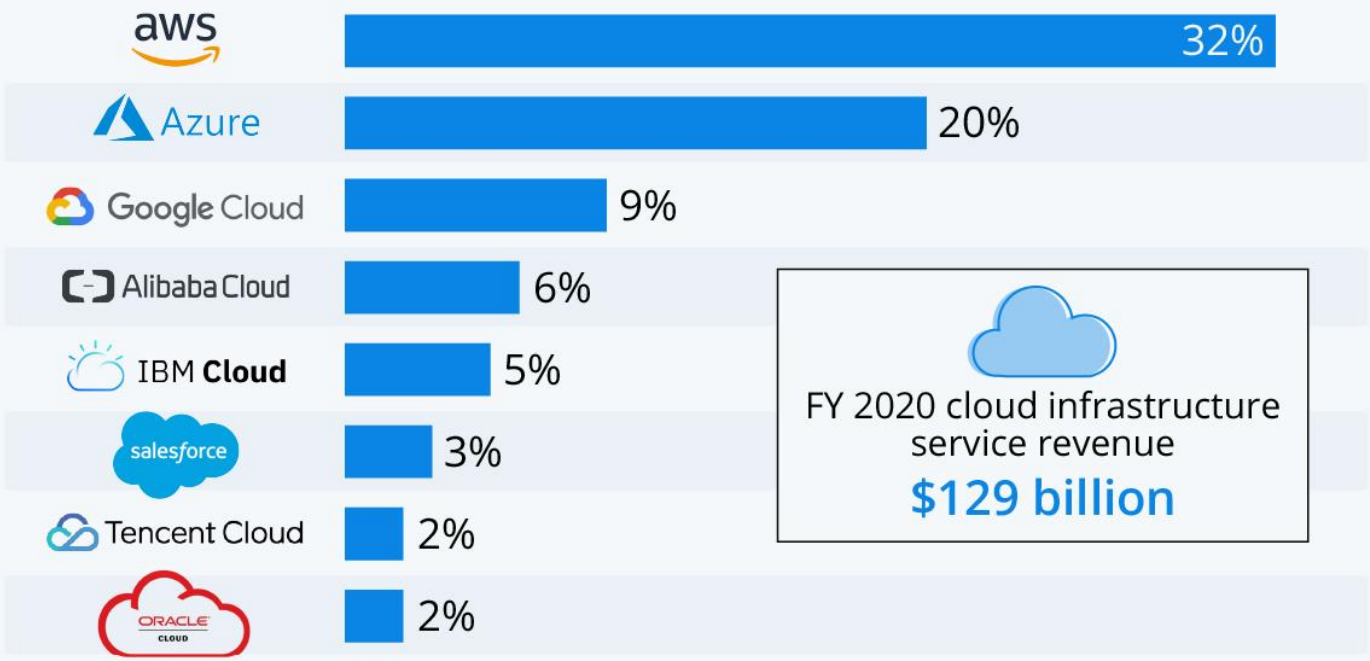
Amazon Leads $130-Billion Cloud Market

Worldwide market share of leading cloud infrastructure service providers in Q4 2020*



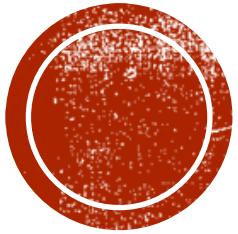
* includes platform as a service (PaaS) and infrastructure as a service (IaaS) as well as hosted private cloud services

Source: Synergy Research Group

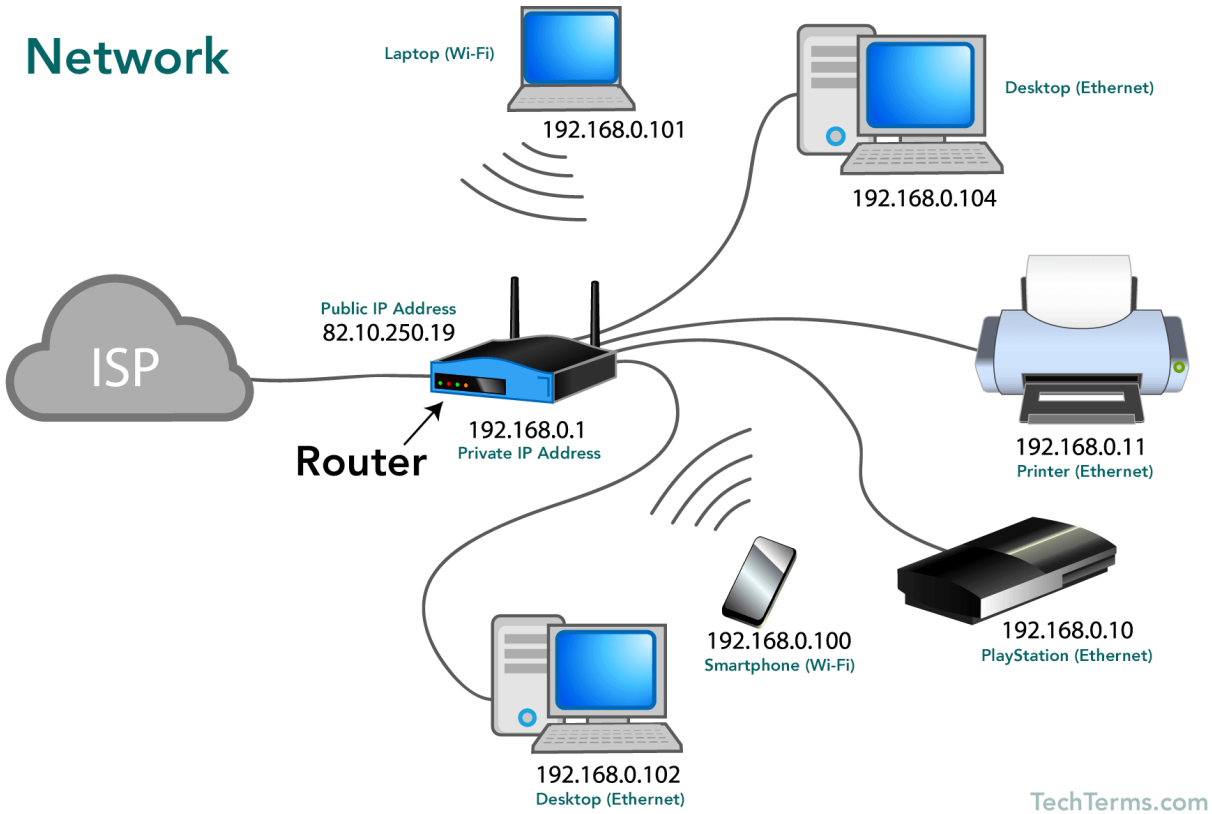
Microsoft Azure =

statista

TOP VENDORS



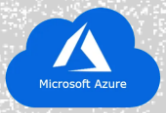
SOMETHING ABOUT NETWORKS & IP ADDRESS



YOUR HOME NETWORK

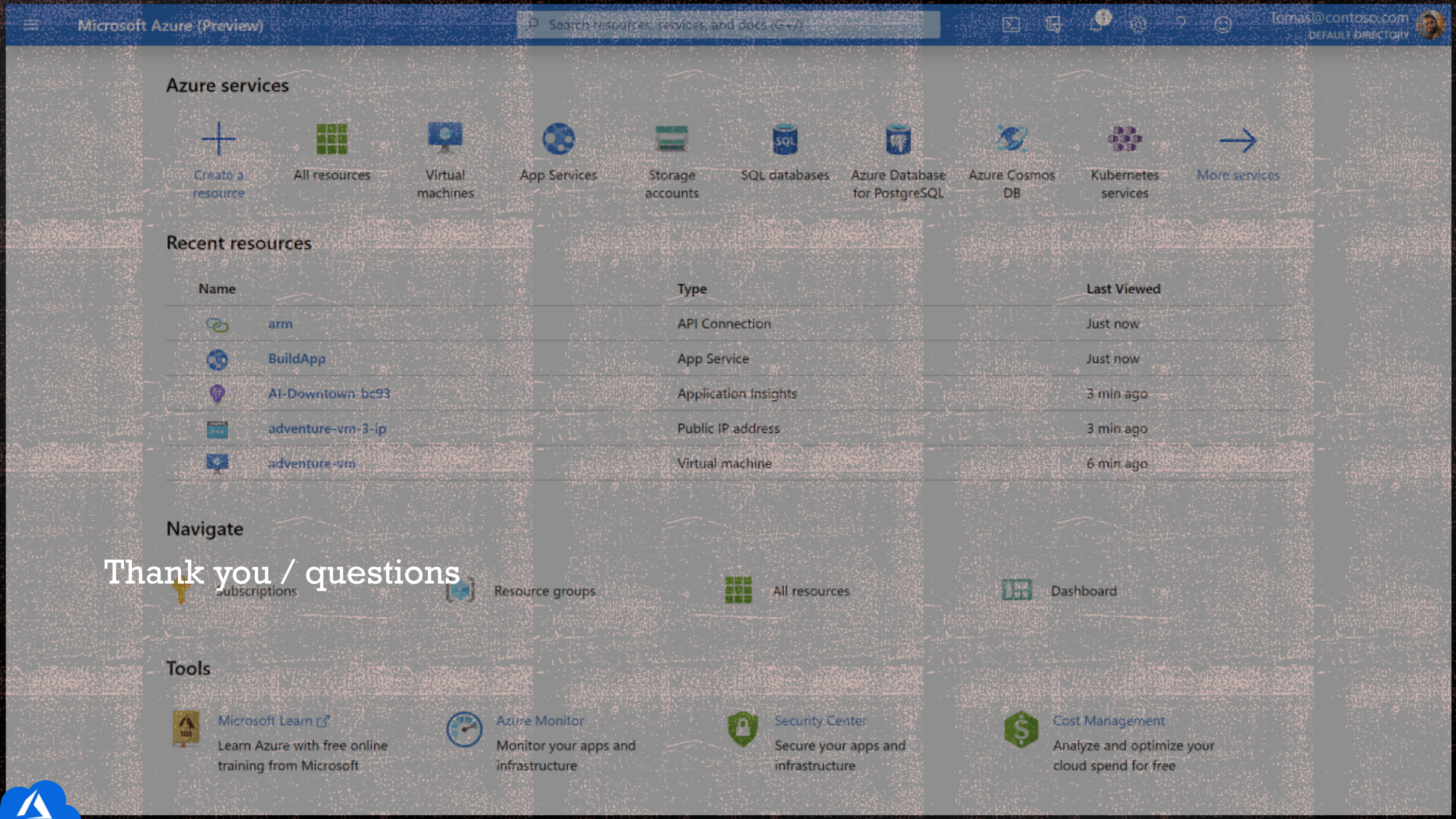
VNET & SUBNET

https://en.wikipedia.org/wiki/Classful_network
https://www.tutorialspoint.com/ipv4/ipv4_subnetting.htm
https://en.wikipedia.org/wiki/List_of_assigned_/8_IPv4_address_blocks



AZURE PORTAL OVERVIEW

CREATE WINDOWS & UBUNTU VM



Thank you / questions

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