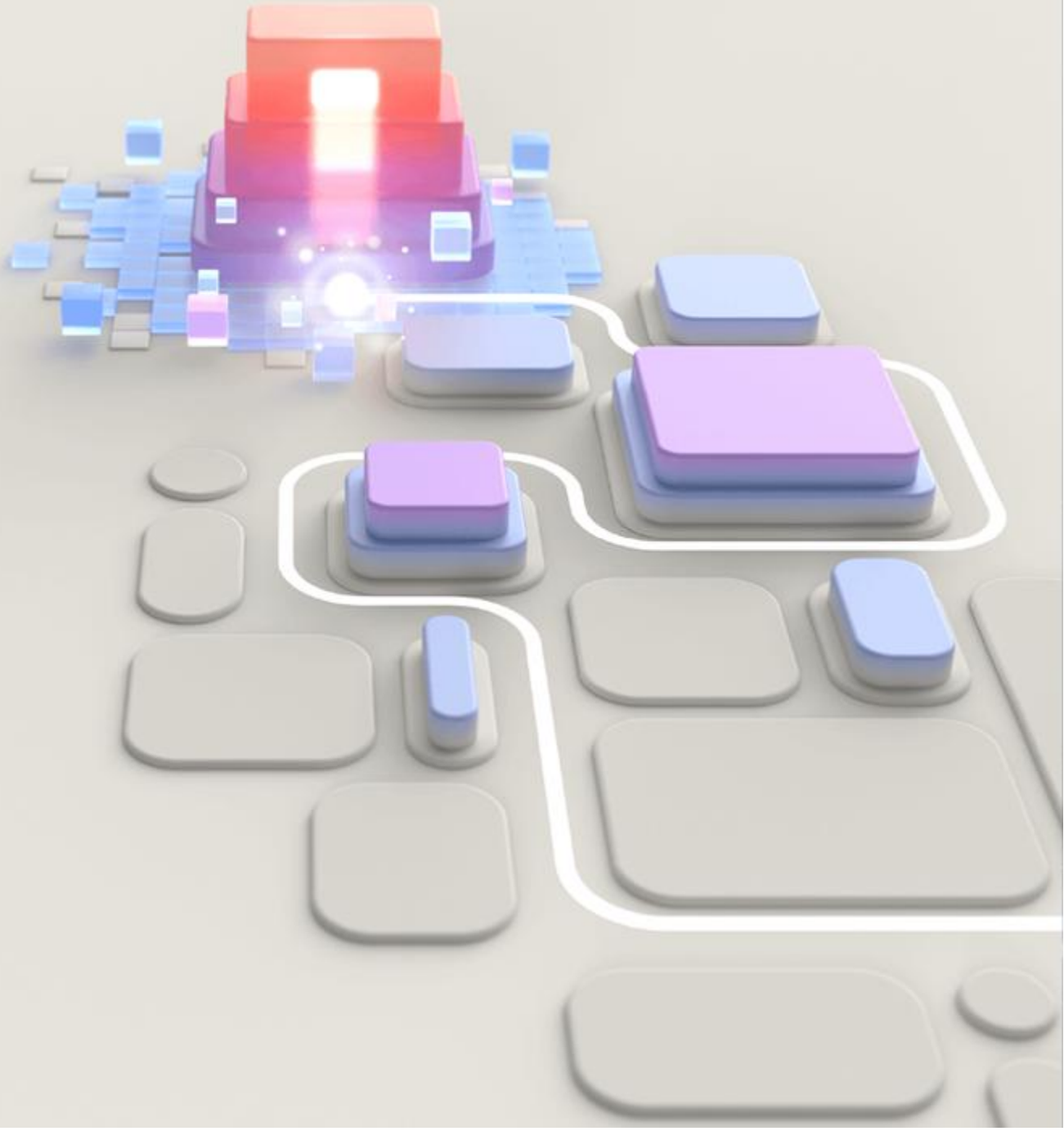
Microsoft



# AZ-104

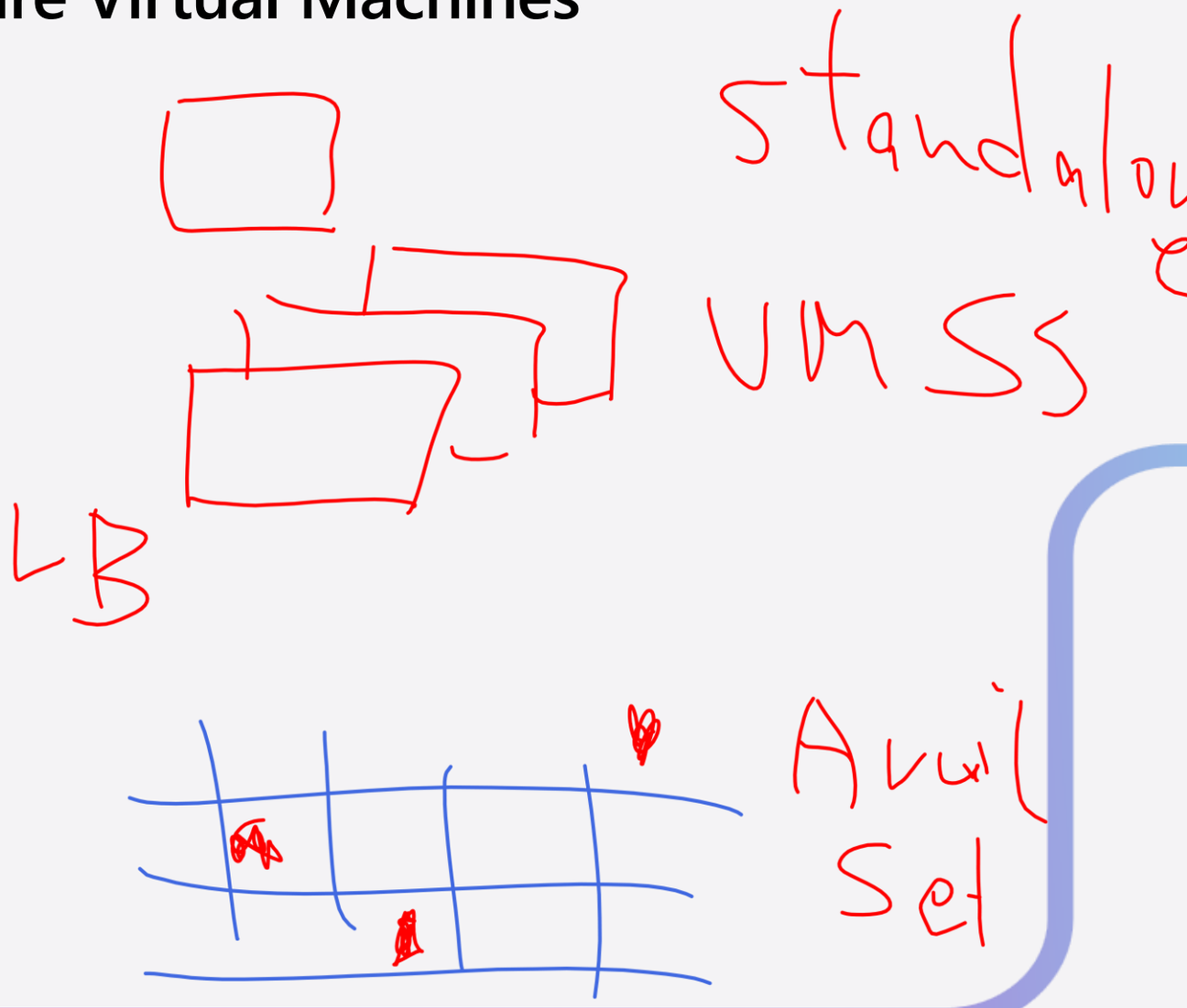
# Administer Azure Virtual Machines

# AZ-104 Course Outline

01: Administer Identity
02: Administer Governance and Compliance
03: Administer Azure Resources
04: Administer Virtual Networking
05: Administer Intersite Connectivity
06: Administer Network Traffic Management
07: Administer Azure Storage
08: Administer Azure Virtual Machines
09: Administer PaaS Compute Options
10: Administer Data Protection
11: Administer Monitoring

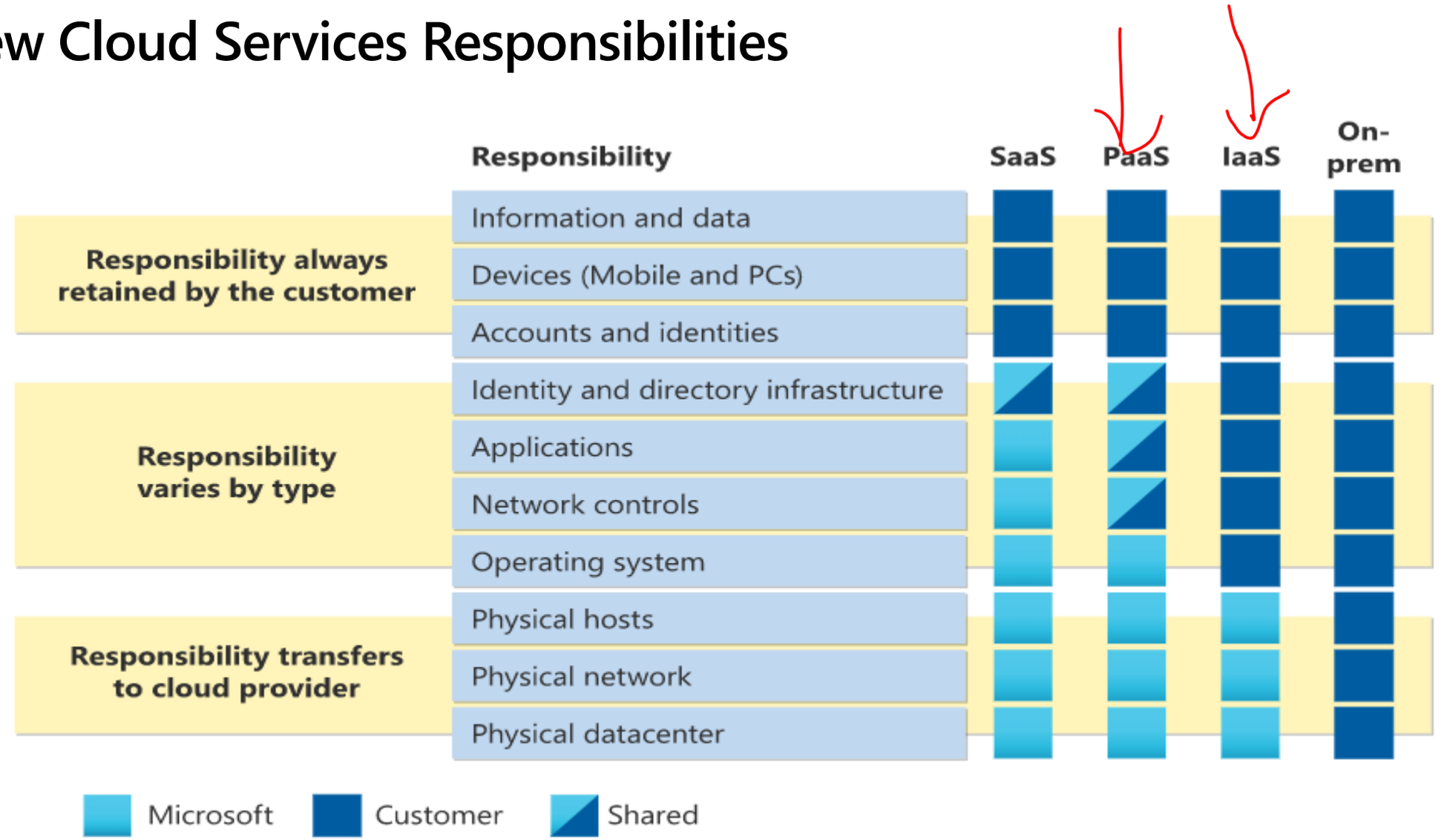
# Learning Objectives - Administer Azure Virtual Machines

- Configure Virtual Machines
- Configure Virtual Machine Availability
- Lab 08 – Manage Virtual Machines



# Configure Virtual Machines

# Review Cloud Services Responsibilities



# Plan Virtual Machines

## Start with the network

## Name the virtual machine

## Choose a location

- Each region has different hardware and service capabilities
- Locate Virtual Machines as close as possible to your users and to ensure compliance and legal obligations

## Consider pricing

70+ Azure regions
Available in 140 countries

# Determine Virtual Machine Sizing

| Type | Description |
| --- | --- |
| General purpose | Balanced CPU-to-memory ratio. |
| Compute optimized | High CPU-to-memory ratio. |
| Memory optimized | High memory-to-CPU ratio. |
| Storage optimized | High disk throughput and I/O. |
| GPU | Specialized virtual machines targeted for heavy graphic rendering and video editing. |
| High performance compute | Our fastest and most powerful CPU virtual machines |

# Determine Virtual Machine Storage

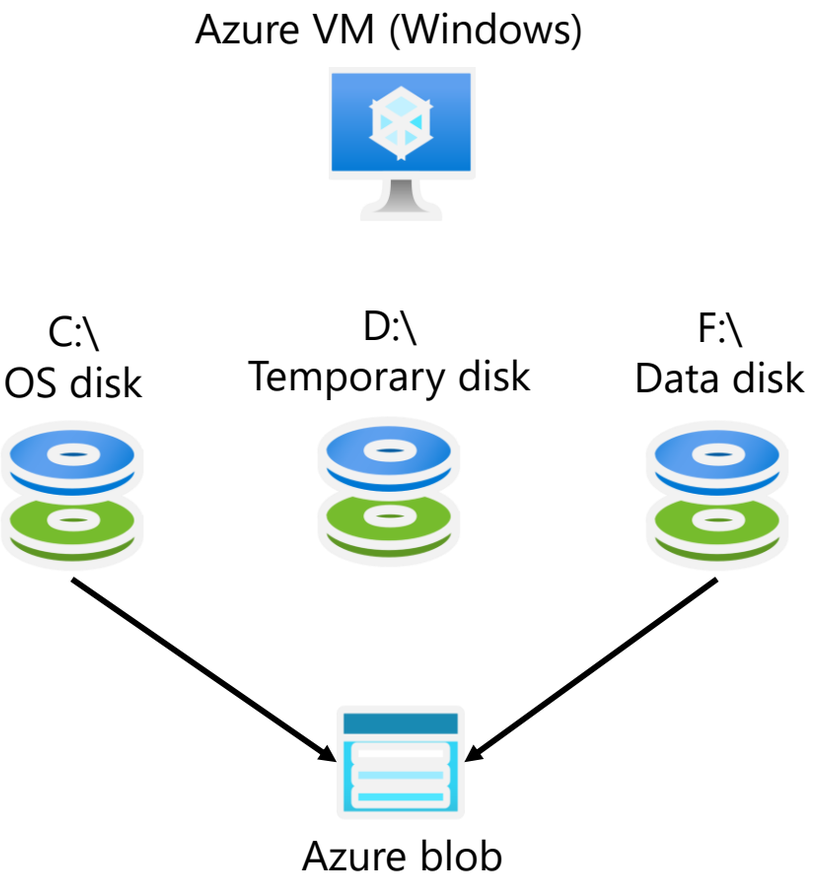
Each Azure VM has two or more disks:

- OS disk
- Temporary disk (not all SKUs have one, content can be lost)
- Data disks (optional)

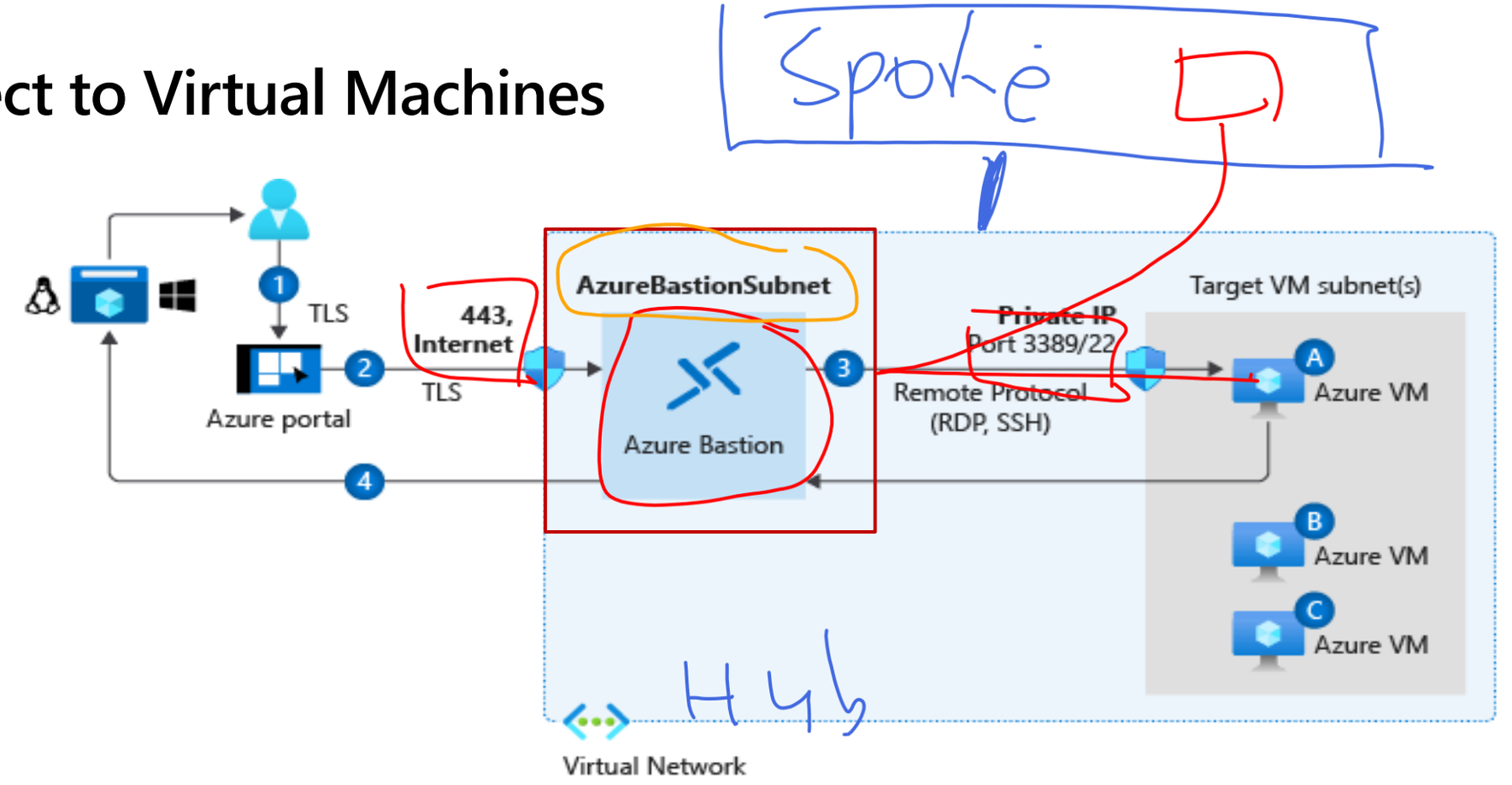
OS and data disks reside in Azure Storage accounts:

- Azure-based storage service
- Standard (HDD, SSD)  or Premium (SSD), or Ultra (SSD)

Azure VMs use managed disks



# Connect to Virtual Machines




Bastion Subnet for RDP/SSH through the Portal over SSL

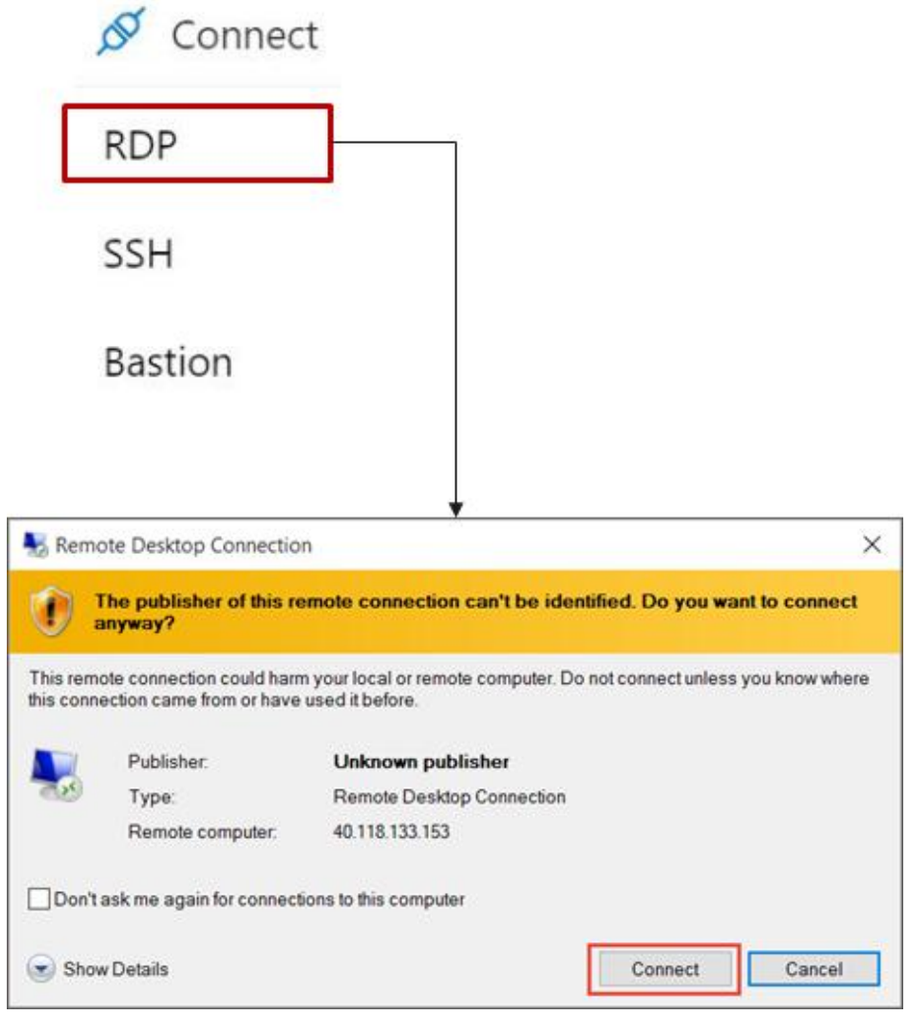
Remote Desktop Protocol for Windows-based Virtual Machines

Secure Shell Protocol for Linux based Virtual Machines

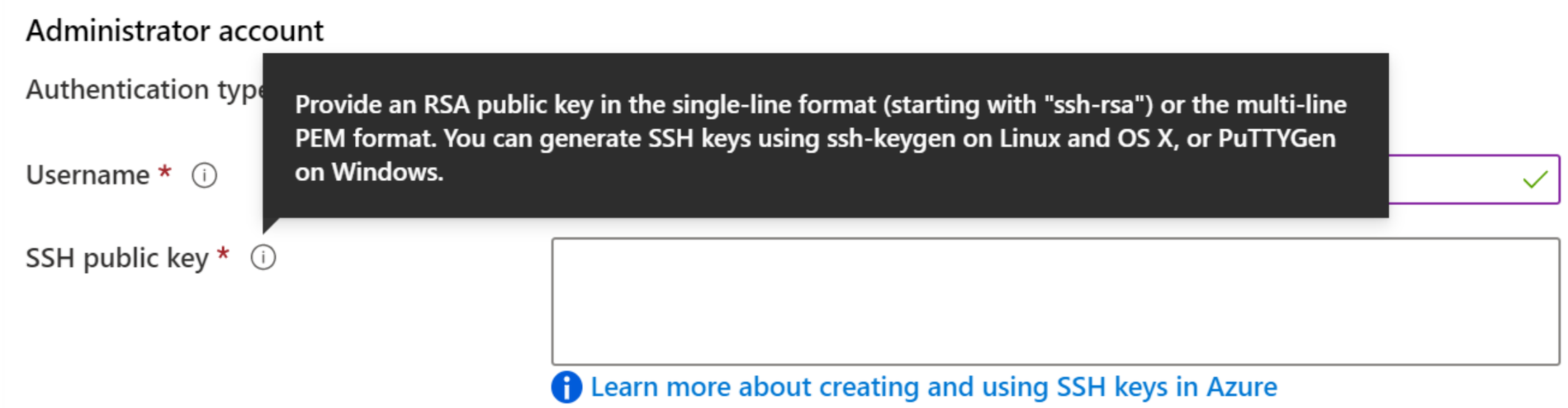
# Connect to Windows Virtual Machines

**Remote Desktop Protocol** (RDP) creates a GUI session and accepts inbound traffic on TCP port 3389

**WinRM** creates a command-line session so you can run scripts



# Connect to Linux Virtual Machines

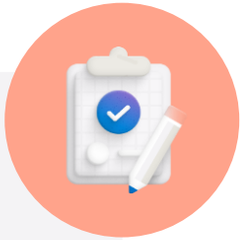



Authenticate with a SSH public key or password

SSH is an encrypted connection protocol that allows secure logins over unsecured connections

There are public and private keys

# Learning Recap - Configure Virtual Machines



## Check your knowledge questions and additional study

- Introduction to Azure virtual machines
- Choose the right disk storage for your virtual machine workload
- Create a Linux virtual machine in Azure
- Create a Windows virtual machine in Azure
- Connect to virtual machines through the Azure portal by using Azure Bastion

# Configure Virtual Machine Availability

# Plan for Maintenance and Downtime

## Unplanned Hardware Maintenance

When the platform predicts a failure, it will issue an **unplanned hardware maintenance** event

**Action:** Live migration

## Unexpected Downtime

**Unexpected Downtime** is when a virtual machine fails unexpectedly

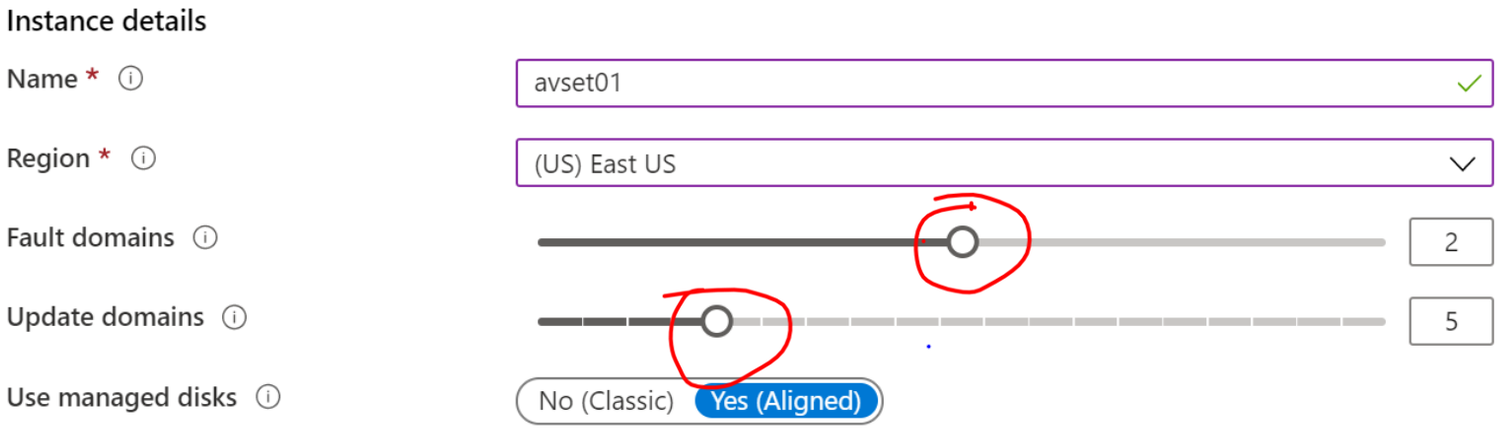
**Action:** Automatically migrate (heal)

## Planned Maintenance

**Planned Maintenance** events are periodic updates made to the Azure platform

**Action:** No action

# Setup Availability Sets




Two or more instances in Availability Sets = 99.95% SLA

Configure multiple Virtual Machines in an Availability Set

Configure each application tier into separate Availability Sets

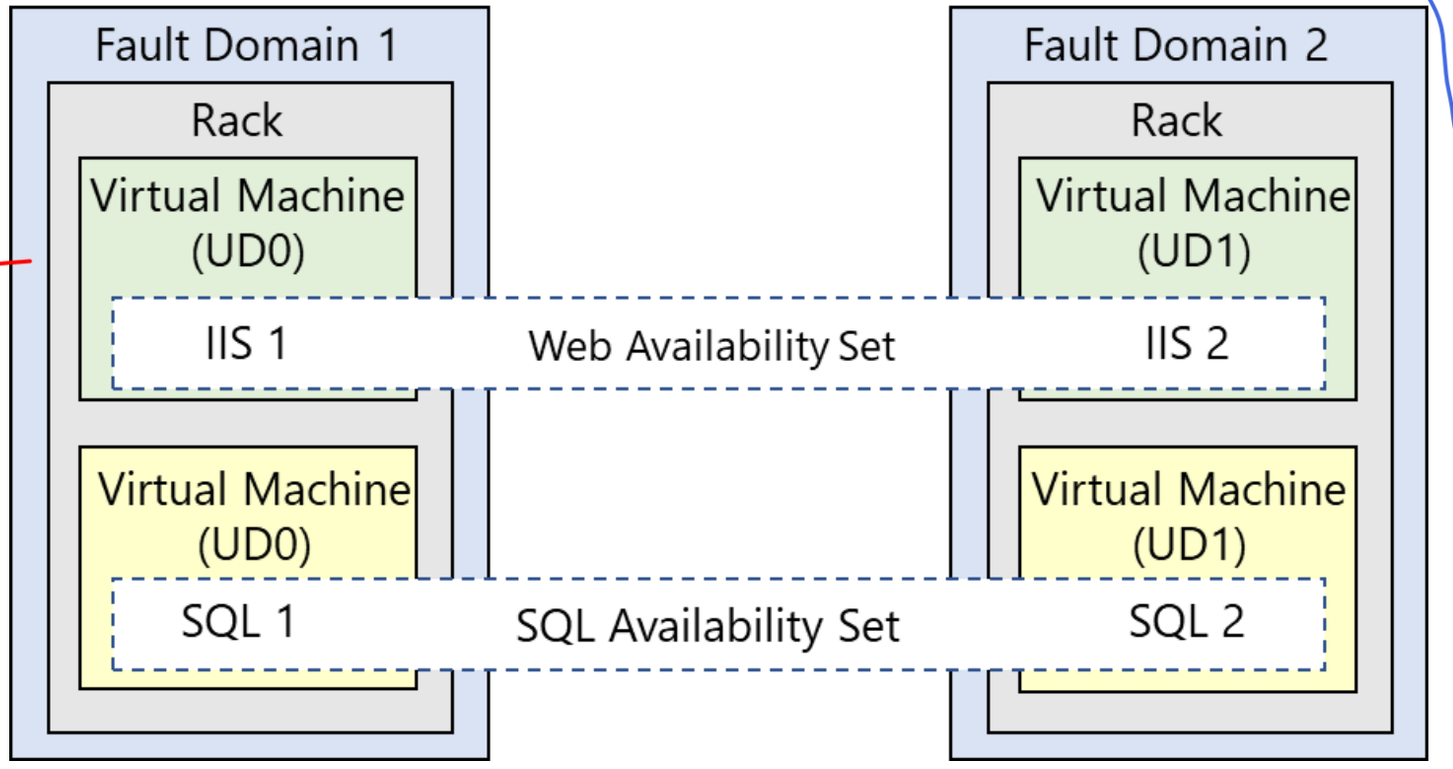
Combine a Load Balancer with Availability Sets

Use managed disks with the Virtual Machines

# Review Update and Fault Domains

**Update domains** allows Azure to perform incremental or rolling upgrades across a deployment. During planned maintenance, only one update domain is rebooted at a time

**Fault Domains** are a group of Virtual Machines that share a common set of hardware, switches, that share a single point of failure. VMs in an availability set are placed in at least two fault domains



# Review Availability Zones

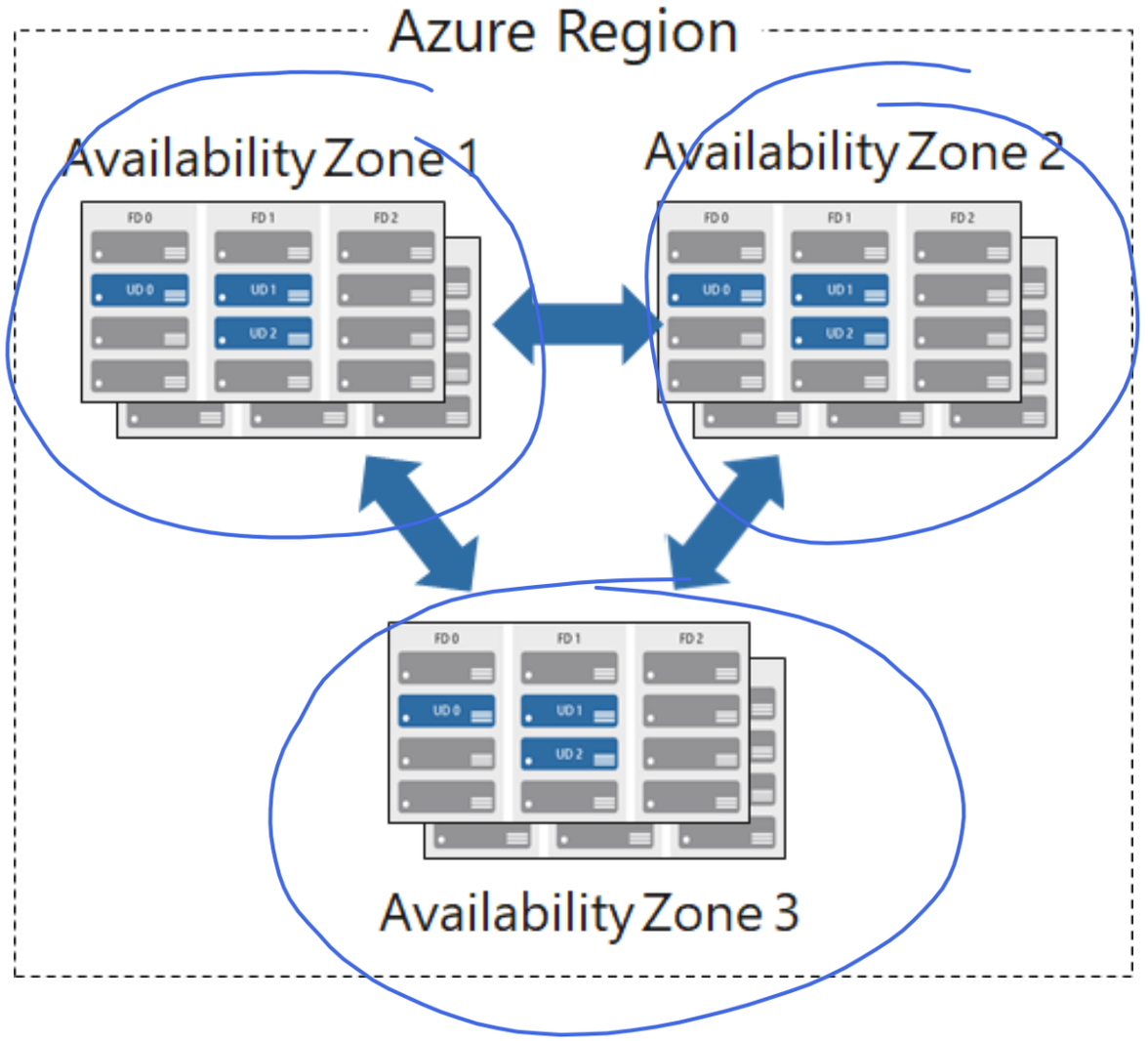
Unique physical locations in a region

Includes datacenters with independent power, cooling, and networking

Protects from datacenter failures

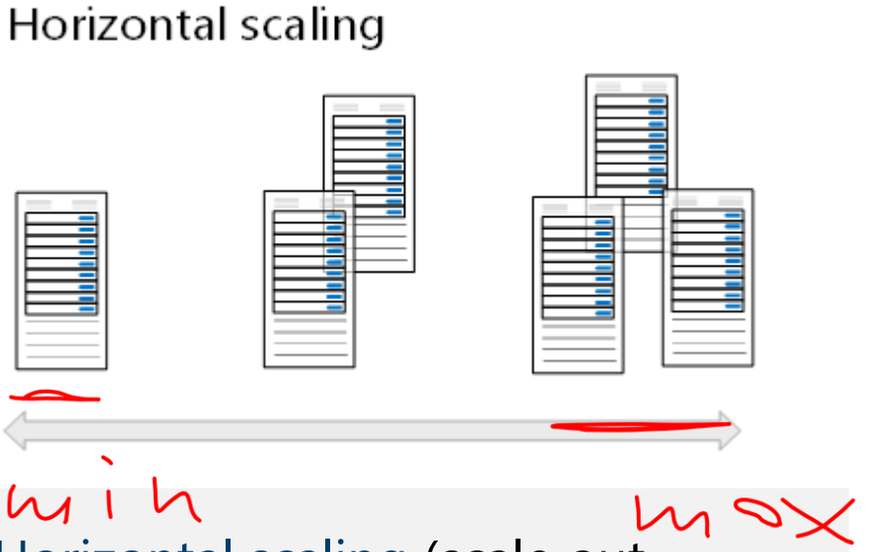
Combines update and fault domains

Provides 99.99% SLA



# Compare Vertical to Horizontal Scaling


Vertical scaling (scale up and scale down) is the process of increasing or decreasing power to a single instance of a workload; usually manual




Horizontal scaling (scale out and scale in) is the process of increasing or decreasing the number of instances of a workload; frequently automated

# Create Scale Sets

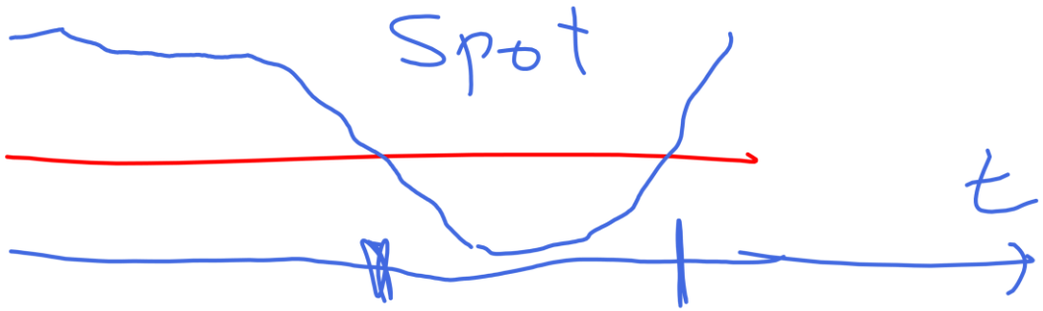
**Instance count.** Number of VMs in the scale set (0 to 1000)

**Instance size**. The size of each virtual machine in the scale set

**Azure Spot Instance.** Unused capacity at a discounted rate

**Use managed disks**

**Enable scaling beyond 100 instances**




**Orchestration**

A scale set has a "scale set model" that defines the attributes of virtual machine instances (size, number of data disks, etc). As the number of instances in the scale set changes, new instances are added based on the scale set model.
Learn more about the scale set model

Orchestration mode * ⓘ
- (●) **Flexible:** achieve high availability at scale with identical or multiple virtual machine types
- ( ) **Uniform:** optimized for large scale stateless workloads with identical instances

Security type ⓘ: Standard

**Instance details**

Image * ⓘ: Ubuntu Server 20.04 LTS - x64 Gen2
See all images | Configure VM generation

VM architecture ⓘ
- ( ) Arm64
- (●) x64

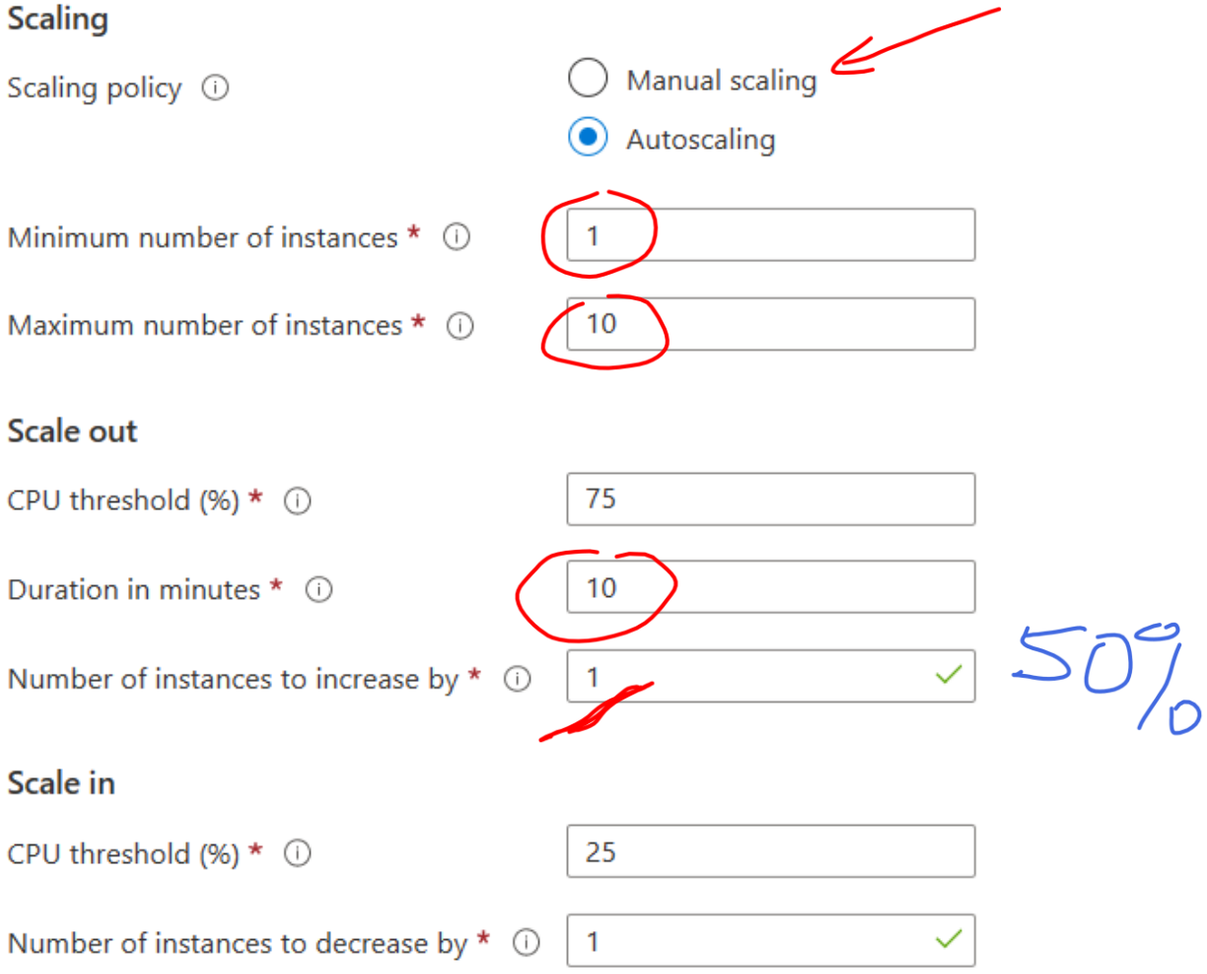
Run with Azure Spot discount ⓘ: [ ]

Size * ⓘ: Standard_D2s_v3 - 2 vcpus, 8 GiB memory ($70.08/month)
See all sizes

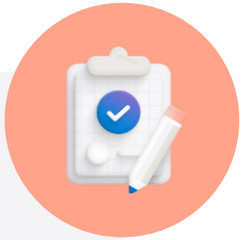
# Configure Autoscale

Define a minimum, maximum, and default number of VM instances

Create more advanced scale sets with scale out and scale in parameters



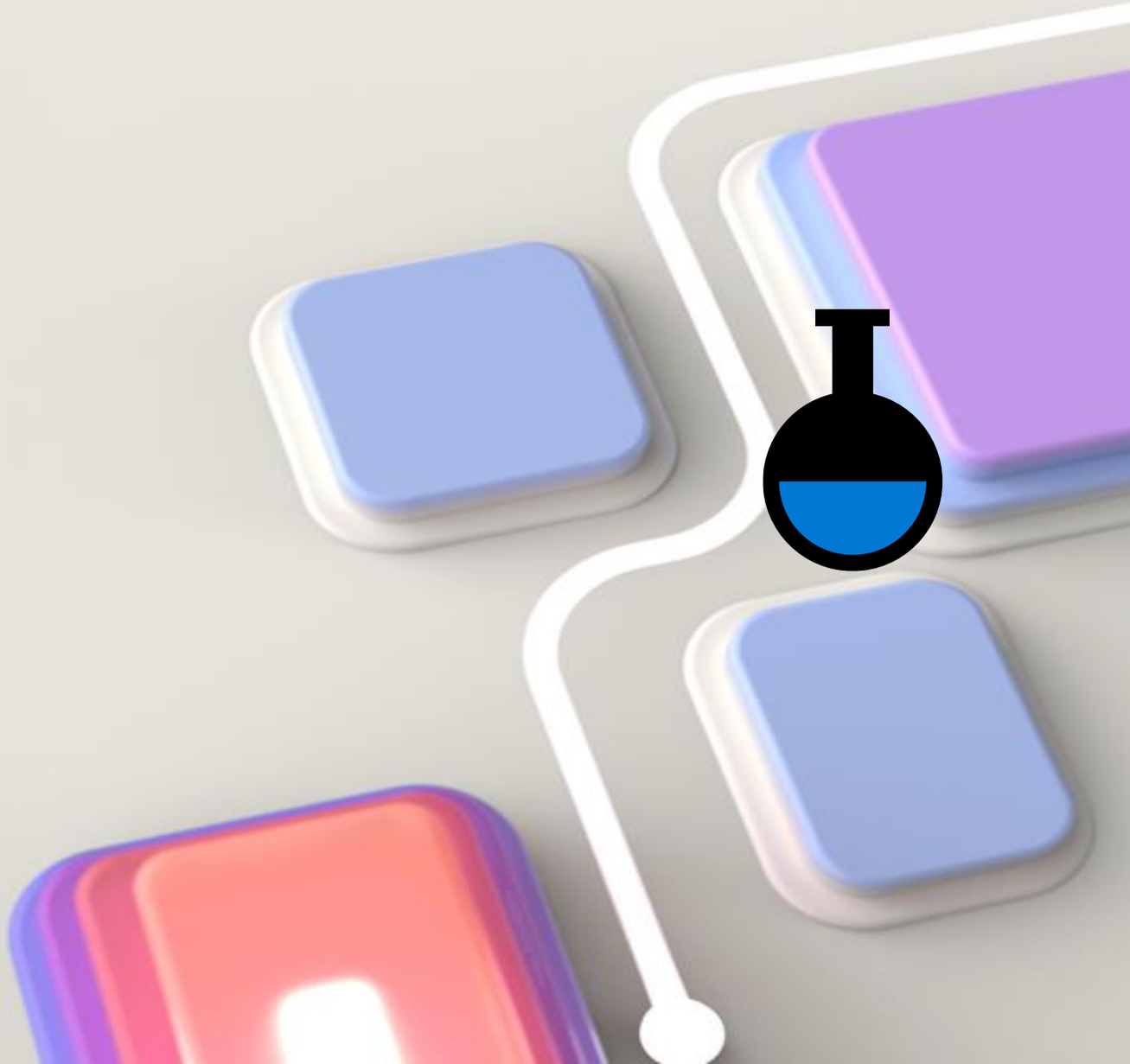
# Learning Recap – Configure Virtual Machine Availability



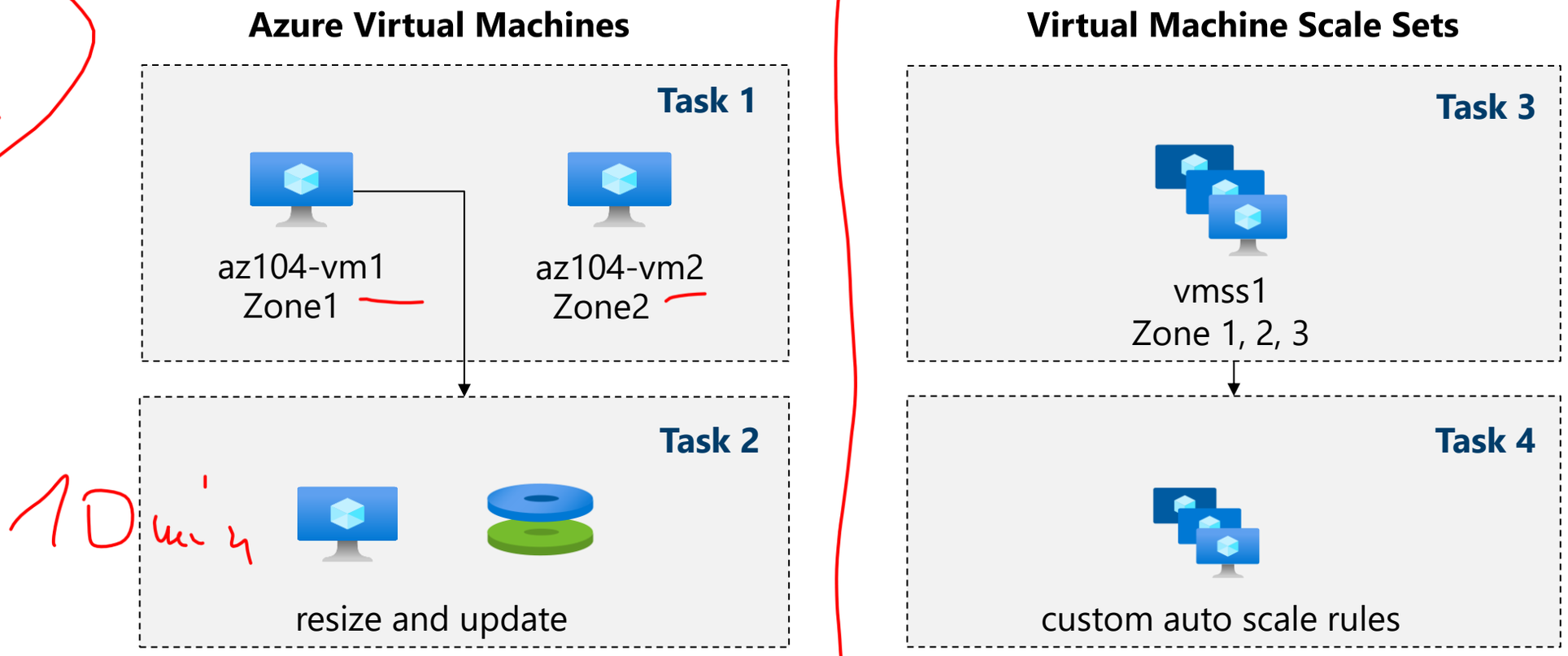
- Build a scalable application with virtual machine scale sets
- Implement scale and high availability with Windows Server VM

## Check your knowledge questions and additional study

# Lab – Manage Virtual Machines



# Lab 08 – Architecture diagram




**Task 5:** Create a virtual machine using Azure PowerShell (option 1)
**Task 6:** Create a virtual machine using the CLI (option 2)

# End of presentation