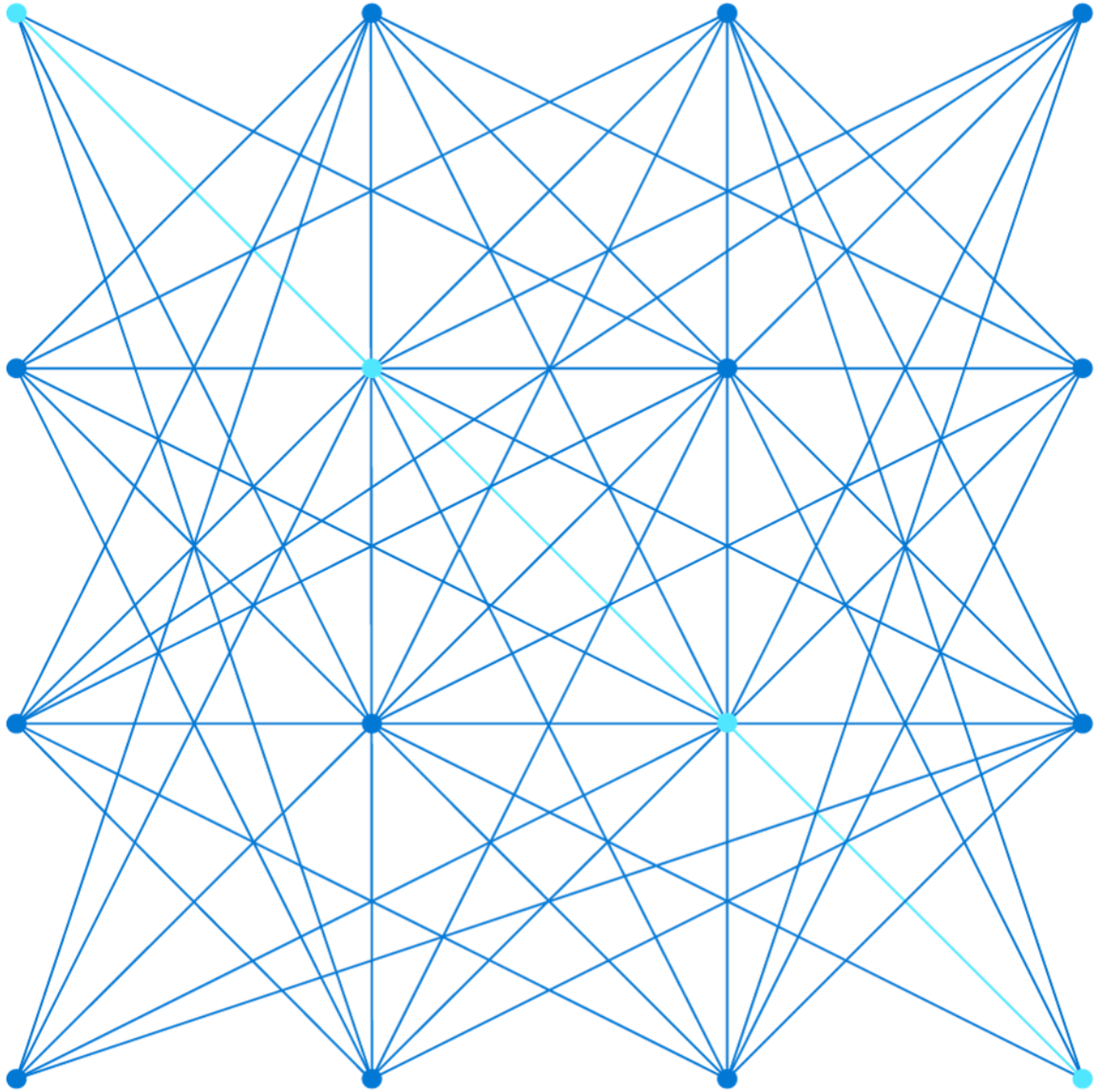
Microsoft Azure

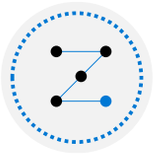
AZ-104

Administer Azure Virtual Machines



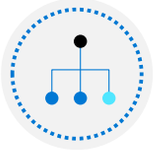
About this course: Course Outline

01: Administer Identity



02: Administer Governance and Compliance

03: Administer Azure Resources

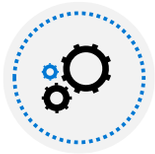


04: Administer Virtual Networking

05: Administer Intersite Connectivity

06: Administer Network Traffic Management

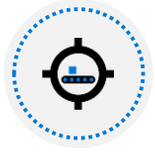
07: Administer Azure Storage



08: Administer Azure Virtual Machines

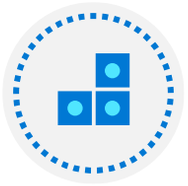
09: Administer PaaS Compute Options

10: Administer Data Protection



11: Administer Monitoring

Administer Azure Virtual Machines Overview

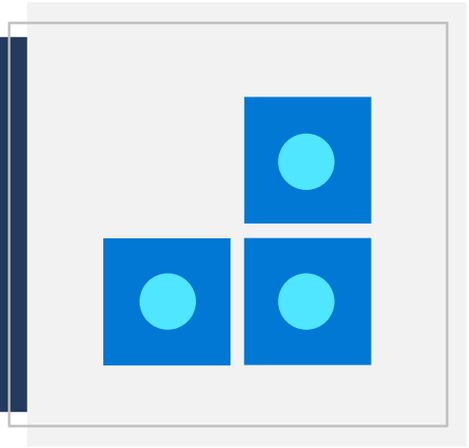


Configure Virtual Machines

Configure Virtual Machine Availability

Lab 08 – Manage Virtual Machines

Configure Virtual Machines



Configure Virtual Machines Introduction


Review Cloud Services Responsibilities


Plan Virtual Machines

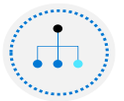

Determine Virtual Machine Sizing


Determine Virtual Machine Storage


Demonstration - Creating a VM in the Portal

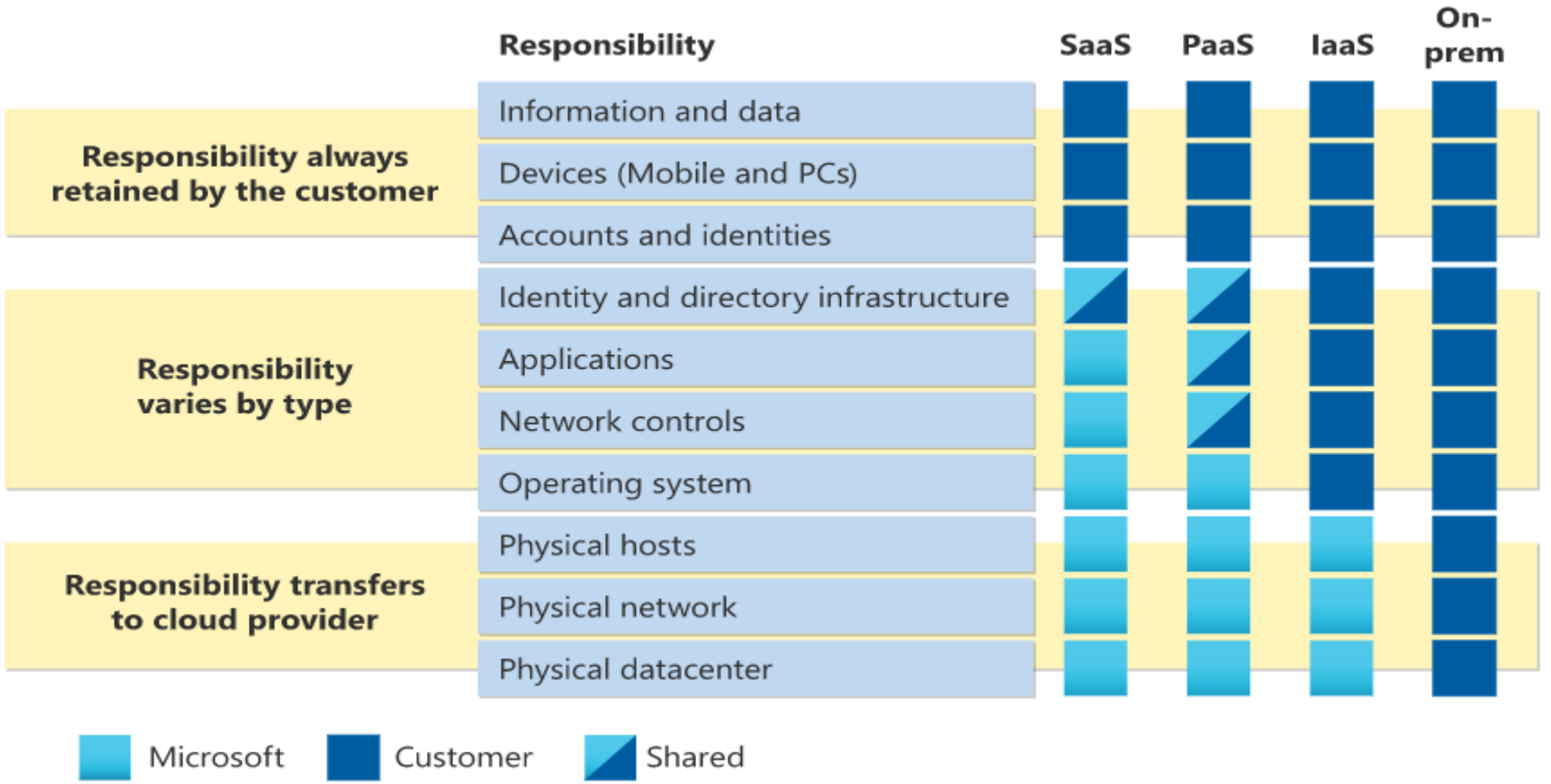

Connect to Virtual Machines


Connect to Windows Virtual Machines


Connect to Linux Virtual Machines


Summary and Resources

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

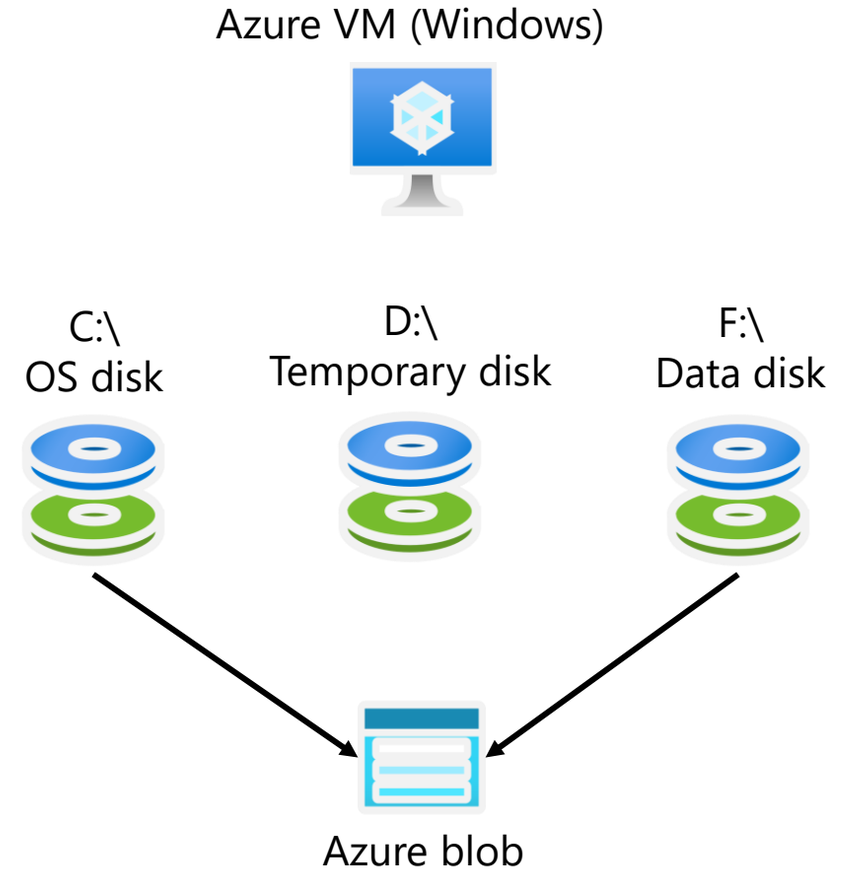
Each Azure VM has two or more disks:

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

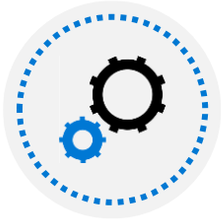
OS and data disks reside in Azure Storage accounts:

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

Azure VMs use managed disks



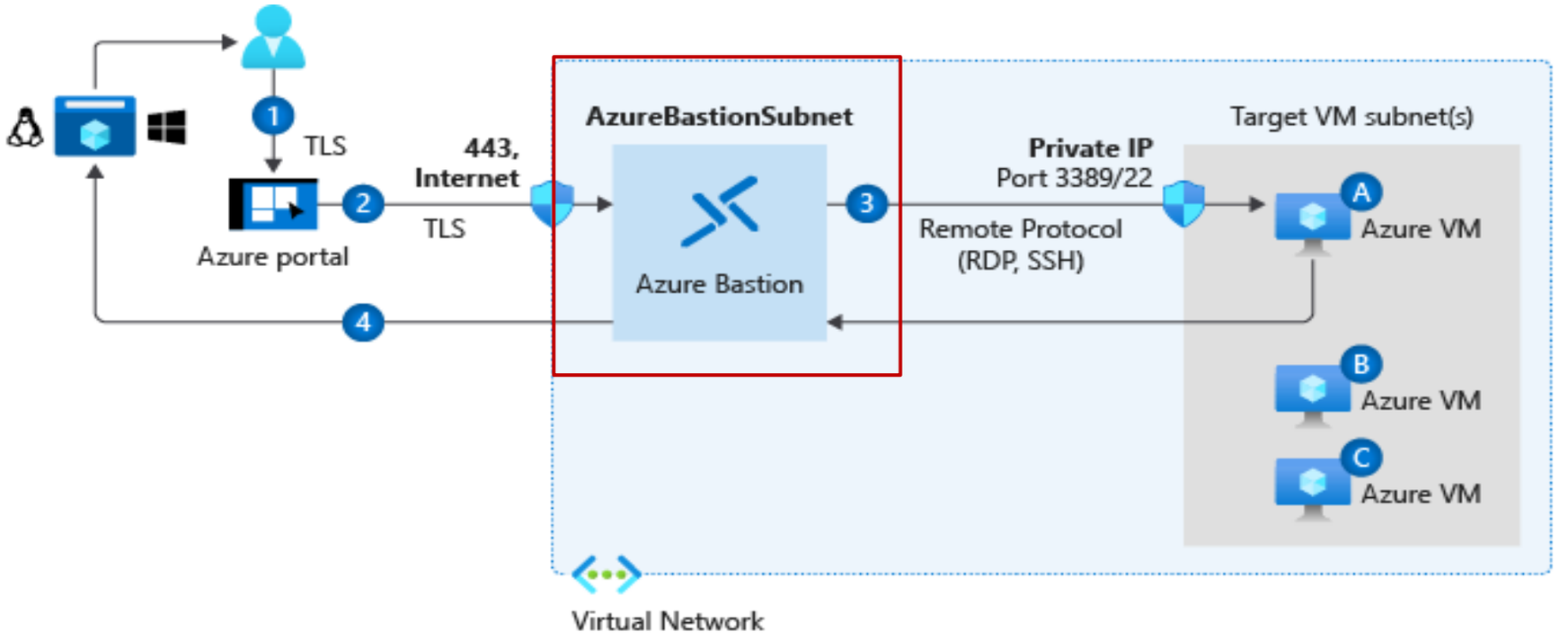
Demonstration – Creating a VM in the Portal



Create the virtual machine

Connect to the virtual machine – Bastion, RDP, or SSH

Connect to Virtual Machines



Bastion Subnet for RDP/SSH through the Portal over SSL

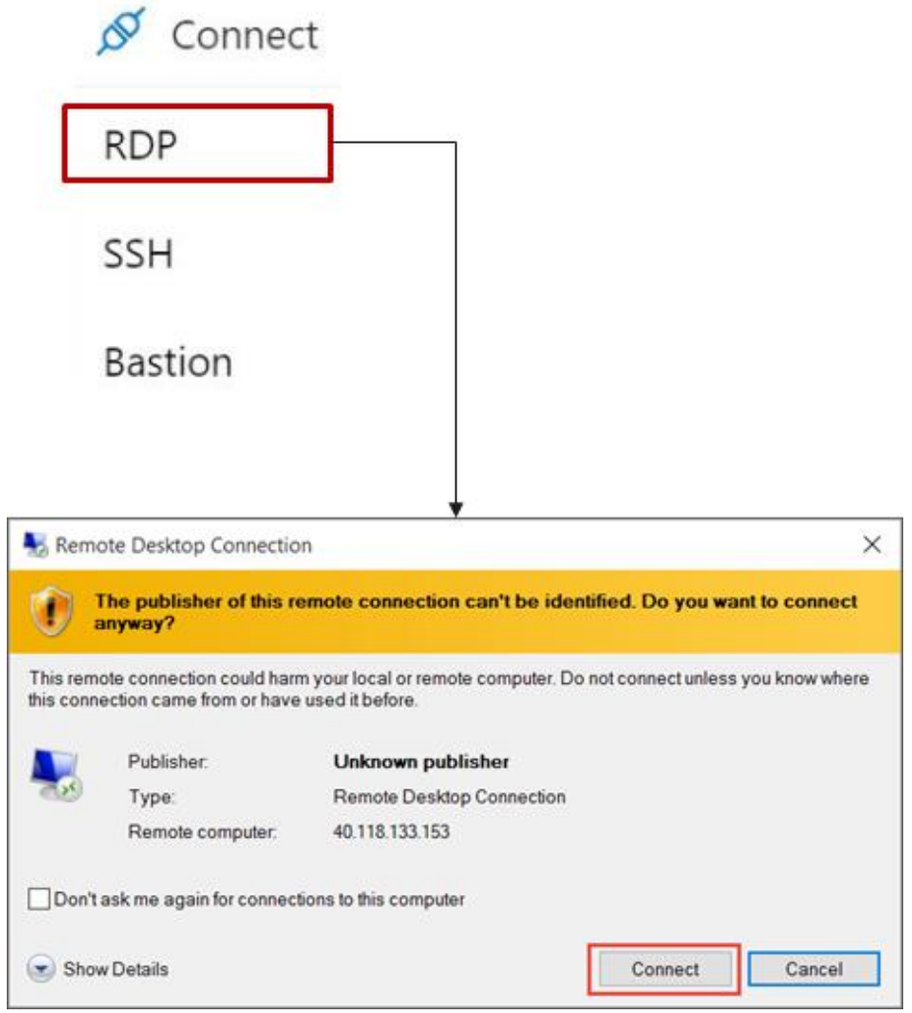
Remote Desktop Protocol for Windows-based Virtual Machines

Secure Shell Protocol for Linux based Virtual Machines

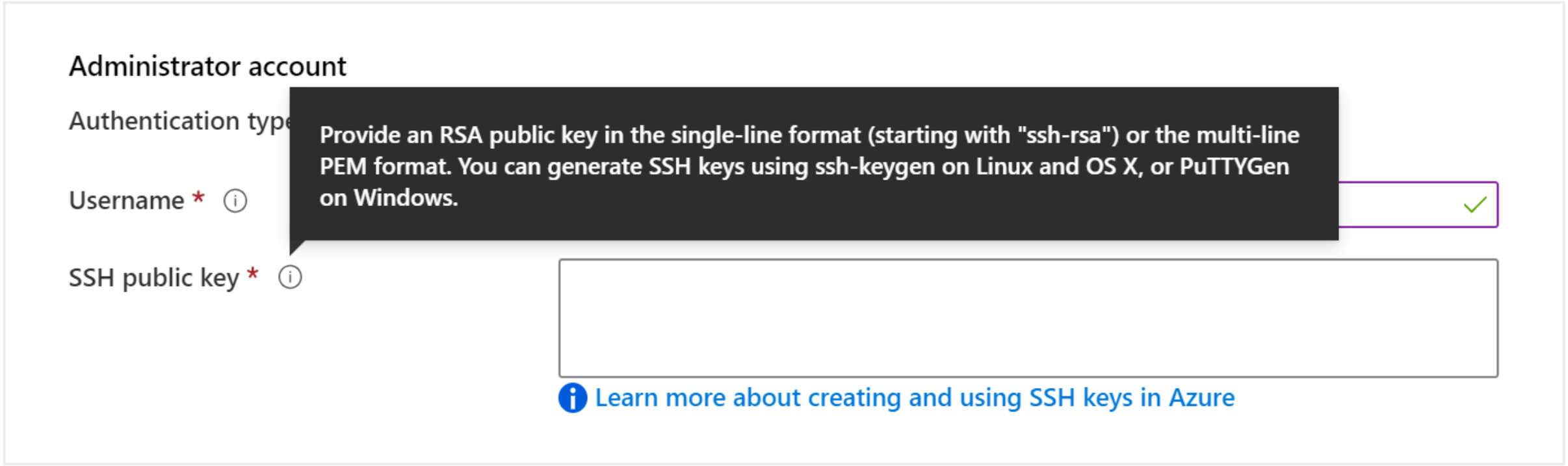
Connect to Windows Virtual Machines

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

Summary and Resources - Configure Virtual Machines

Knowledge Check Questions

Microsoft Learn Modules (docs.microsoft.com/Learn)

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

A *sandbox* indicates a hands-on exercise.

Configure Virtual Machine Availability

Configure Azure Virtual Machine Availability Introduction

Plan for Maintenance and Downtime

Setup Availability Sets

Review Update and Fault Domains

Review Availability Zones

Compare Vertical to Horizontal Scaling

Create Scale Sets (2 student topics)

Configure Autoscale (2 student topics)

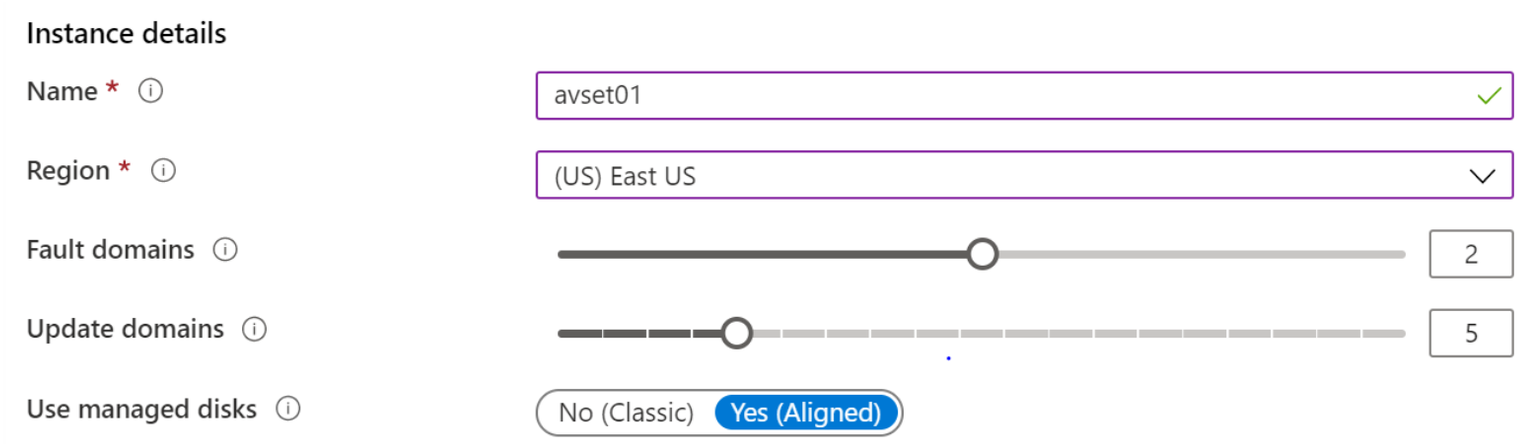
Demonstration – Virtual Machine Scaling

Summary and Resources

Plan for Maintenance and Downtime

Unplanned Hardware Maintenance	Unexpected Downtime	Planned Maintenance
When the platform predicts a failure, it will issue an **unplanned hardware maintenance** event **Action:** Live migration	**Unexpected Downtime** is when a virtual machine fails unexpectedly **Action:** Automatically migrate (heal)	**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

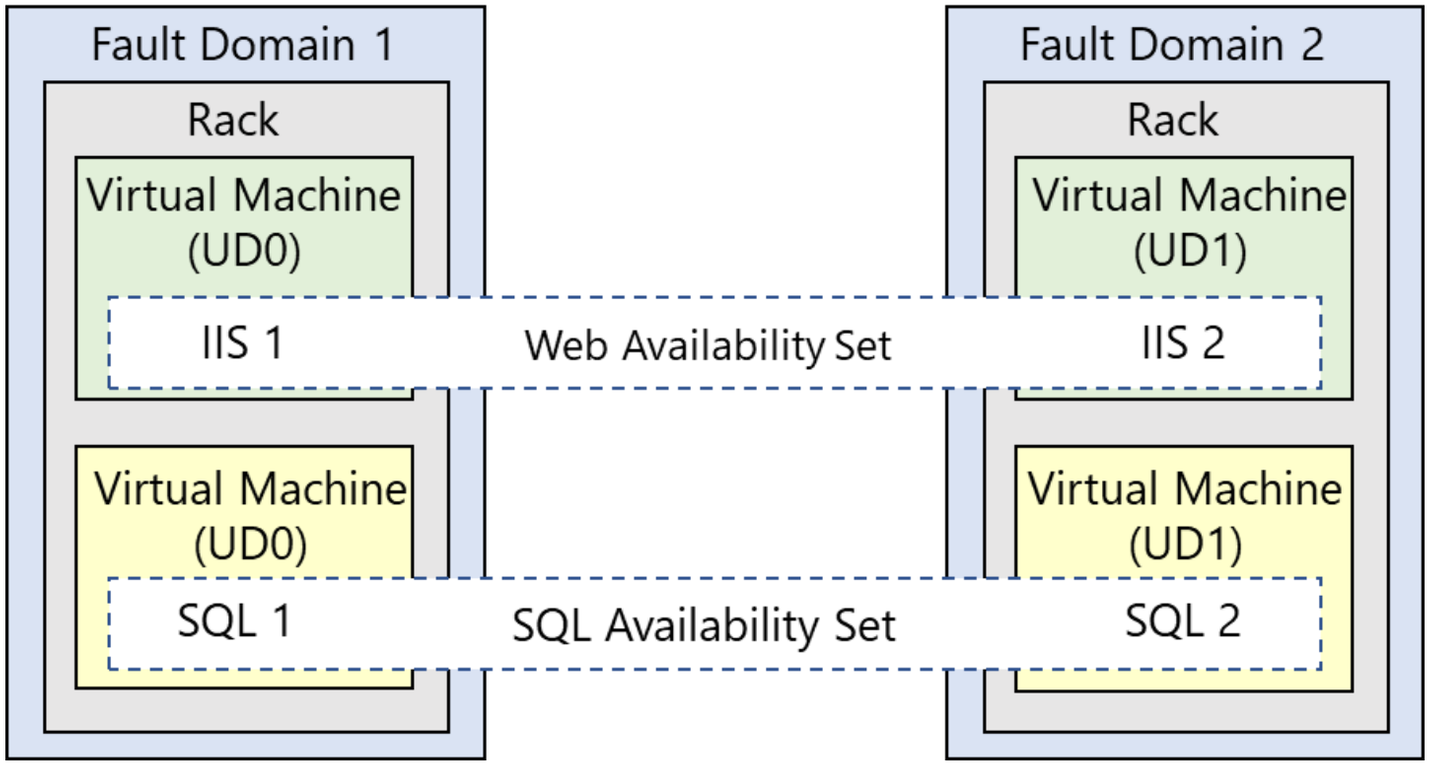
Combine a Load Balancer with Availability Sets

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

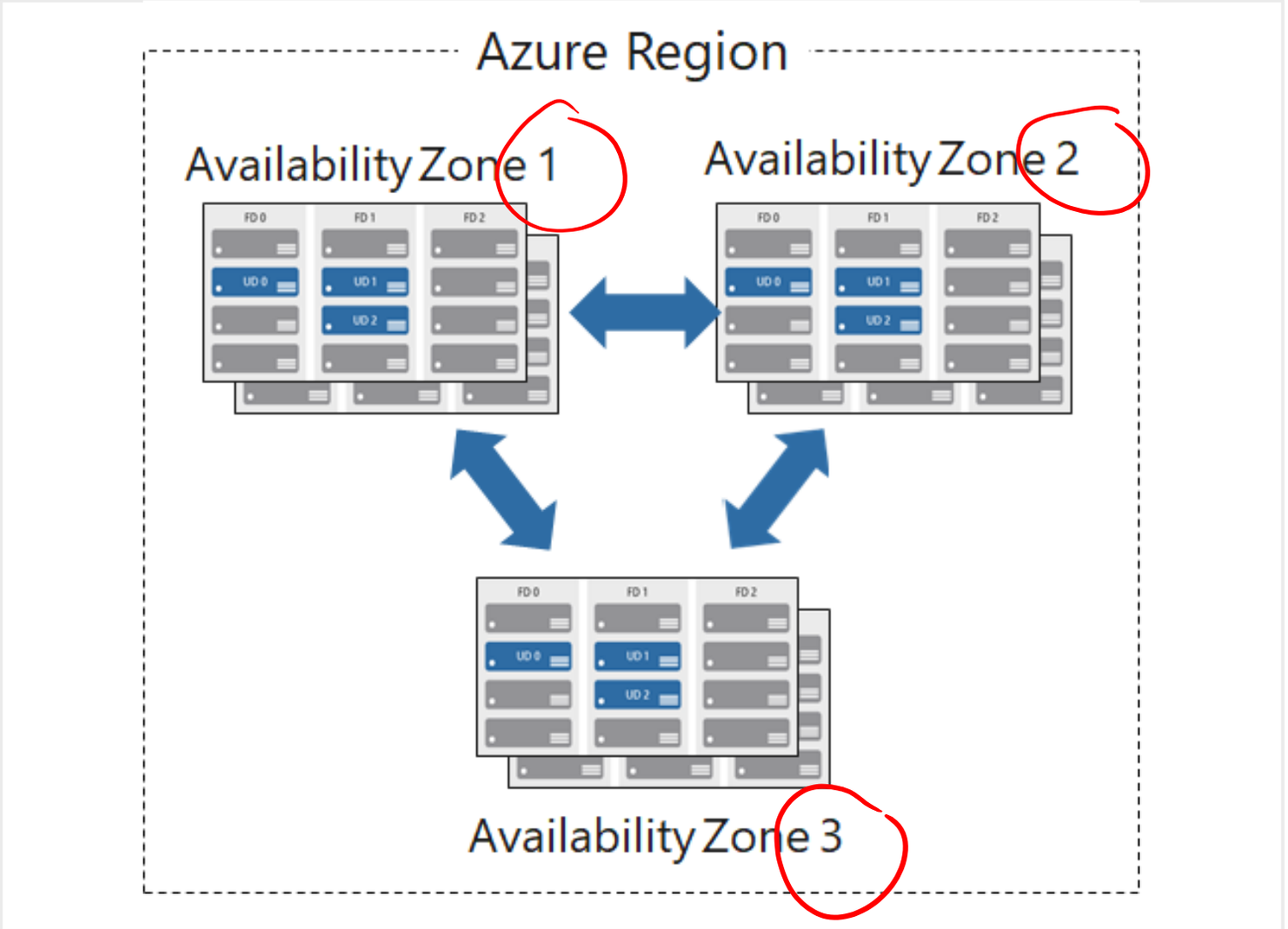
Unique physical locations in a region

Includes datacenters with independent power, cooling, and networking

Protects from datacenter failures

Combines update and fault domains

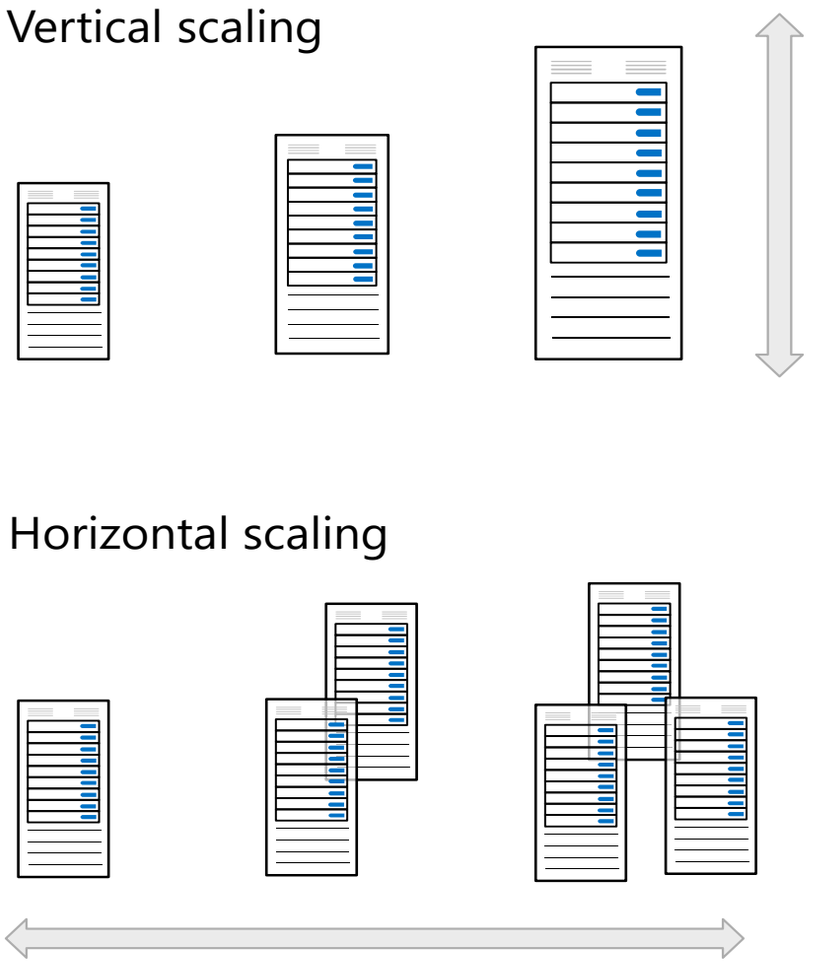
Provides 99.99% SLA



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

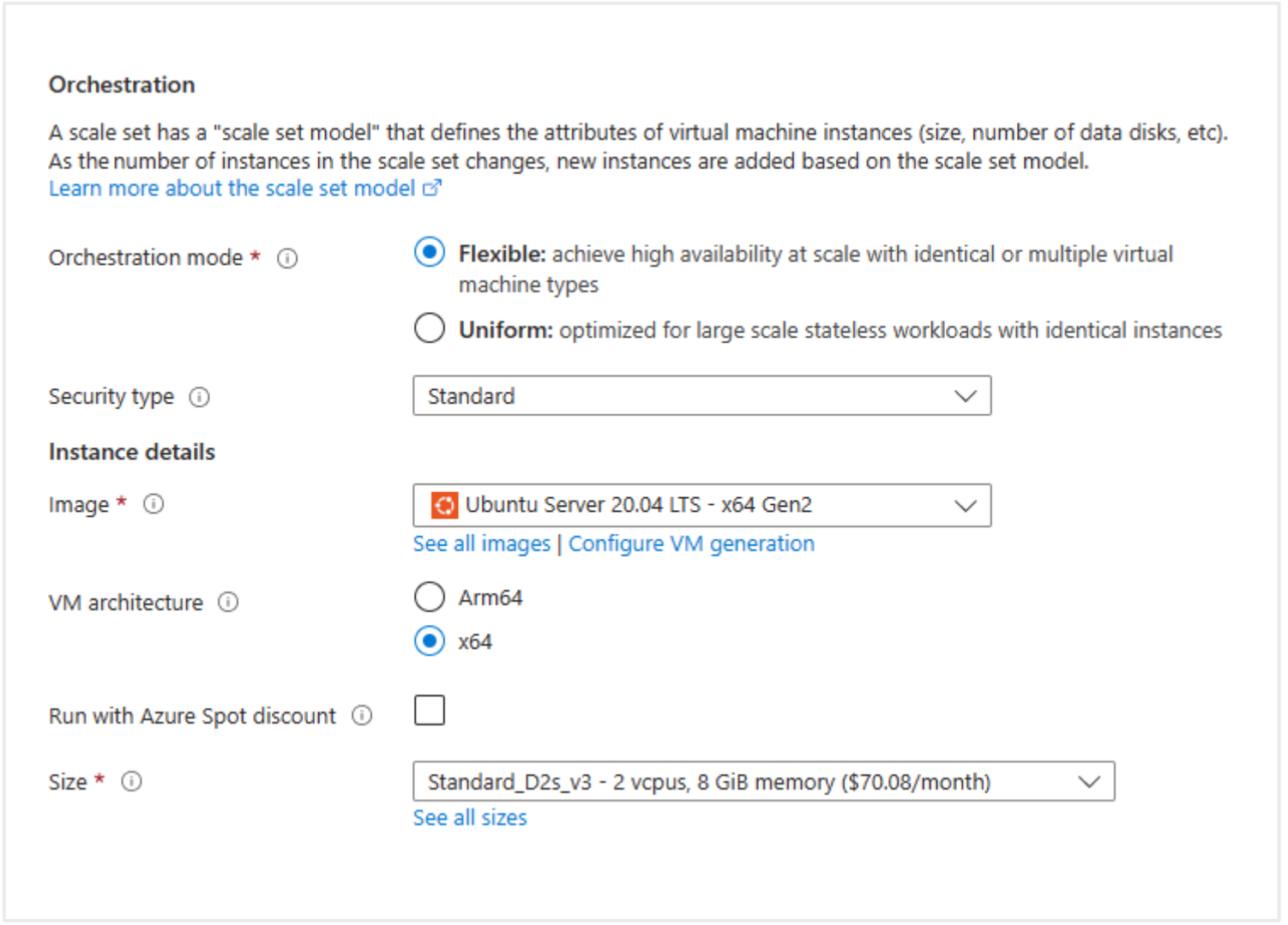
Instance count. Number of VMs in the scale set (0 to 1000)

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

Azure Spot Instance. Unused capacity at a discounted rate

Use managed disks

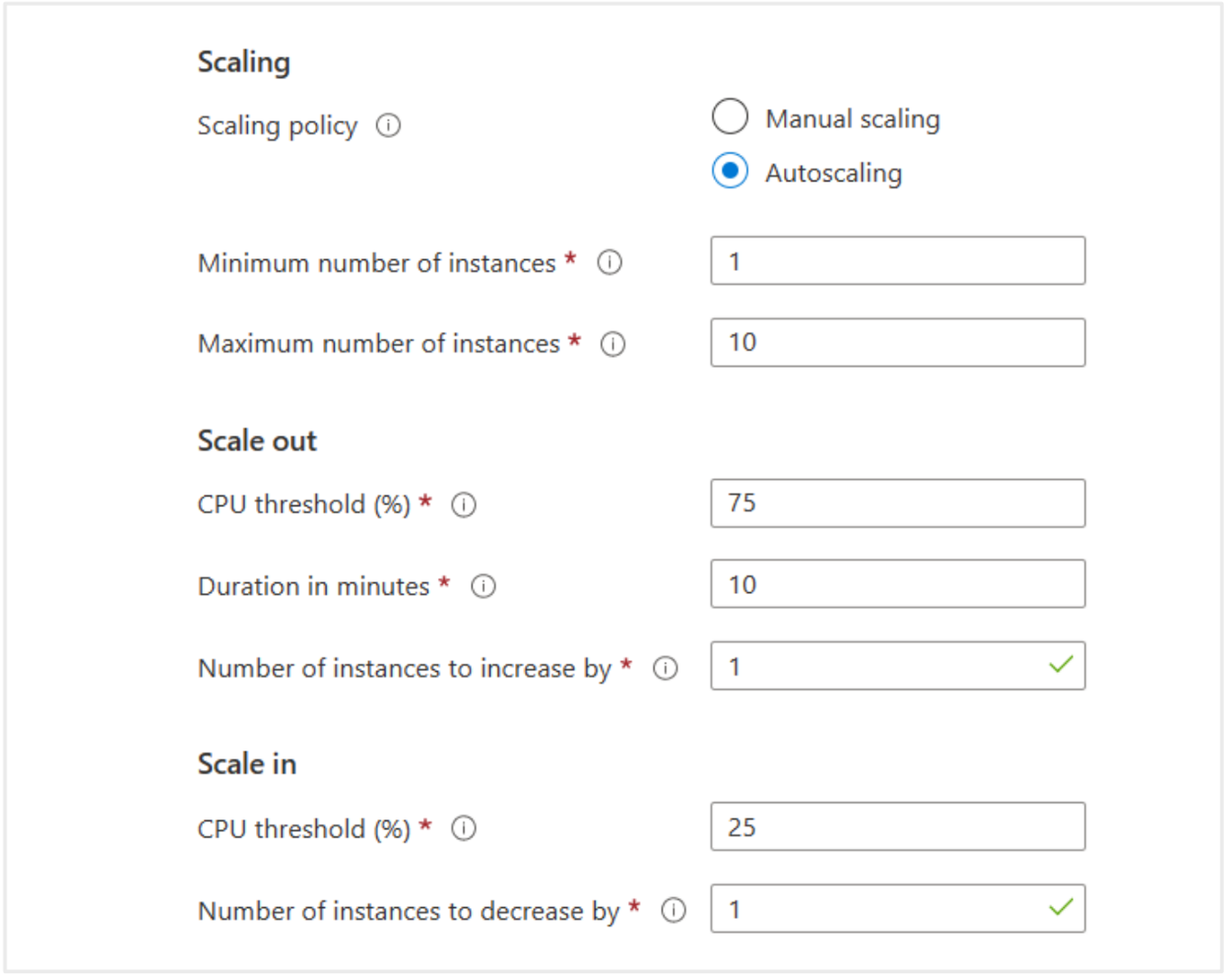
Enable scaling beyond 100 instances



Configure Autoscale

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

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



Demonstration – Virtual Machine Scaling

Configure Virtual Machine Scale Sets

Review manual scaling, scale-in policies, and custom scaling options

Summary and Resources – Configure Virtual Machine Availability

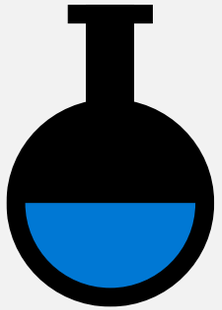
Knowledge Check Questions

Microsoft Learn Modules (docs.microsoft.com/Learn)

Build a scalable application with virtual machine scale sets

Implement scale and high availability with Windows Server VM

Lab – Manage Virtual Machines



Lab 08 – Manage Virtual Machines

Lab scenario

You are tasked with identifying different options for deploying and configuring Azure Virtual Machines

Objectives

Task 1:
Deploy zone-resilient Virtual Machines in the Azure portal and with templates

Task 2:
Configure Azure Virtual Machines by using virtual machine extensions

Task 3:
Scale compute and storage for Azure Virtual Machines

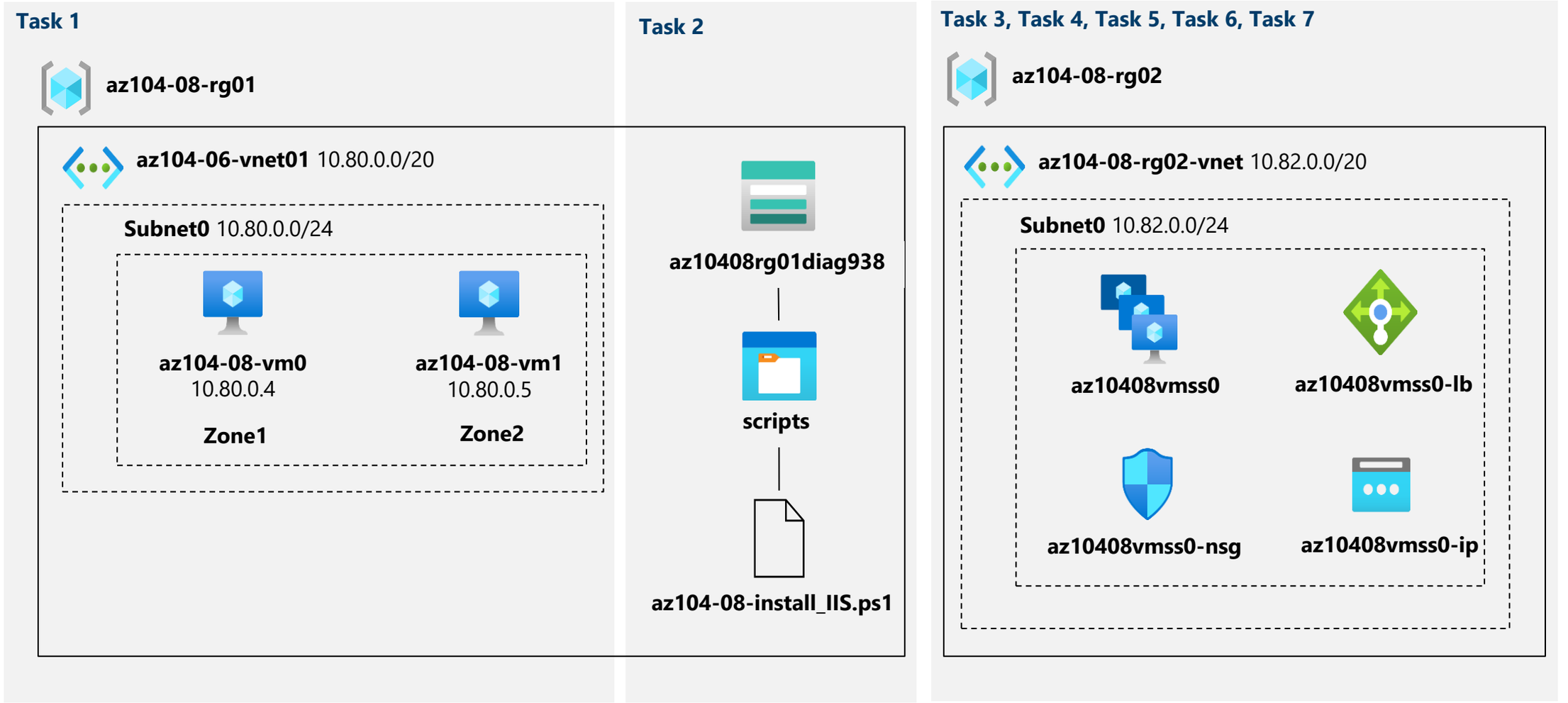
Task 4:
Deploy zone-resilient scale sets by using the Azure portal

Task 5:
Configure Azure virtual machine scale sets by using extensions

Task 6:
Scale compute and storage for Azure virtual machine scale sets

Next slide for an architecture diagram

Lab 08 – Architecture diagram



End of presentation