AZ-104T00A Administer Azure Virtual Machines

Learning Objectives - Administer Azure Virtual Machines

- Configure Virtual Machines
- Configure Virtual Machine Availability

Configure Virtual Machines

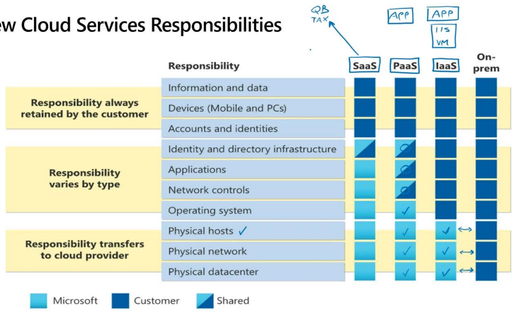
Learning Objectives - Configure Virtual Machines

- 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
- Learning Recap

Implement and manage Azure compute resources (20-25%): Create and configure virtual machines
- Create a VM
- Manage images with the Compute Gallery
- Configure Azure Disk Encryption
- Move VMs
- Manage VM sizes
- Add data disks
- Configure VM network settings

Configure secure access to virtual networks
- Implement Azure Bastion

Review Cloud Services Responsibilities



Plan Virtual Machines

APP

Start with the network ✓

Name the virtual machine IRAN-SVR-01 ~999

Choose a location C L $ R GPU
- 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

Plan Virtual Machines

Consider purpose

APP
IIS
PLEX - MEDIA
DB
SQL
FILE
PRINT
K8S CONTAINER
DC
FTP
VoIP
EXCHANGE
DNS
DHCP

60+ Azure regions
Available in 140 countries

Determine Virtual Machine Sizing

	Type	Description
	General purpose	Balanced CPU-to-memory ratio.
1	Compute optimized ✓	High CPU-to-memory ratio. NETWORK
2	Memory optimized ✓	High memory-to-CPU ratio. SQL EMR
3	Storage optimized ✓	High disk throughput and I/O.
	GPU $	Specialized virtual machines targeted for heavy graphic rendering and video editing.
	High performance compute	Fastest and most powerful CPU virtual machines

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Determine Virtual Machine Sizing

https://learn.microsoft.com/en-us/azure/virtual-machines/sizes

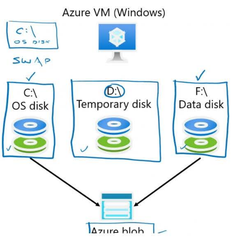
Type	Sizes	Description
General purpose	B, Dsv3, Dv3, Dasv4, Dav4, DSv2, Dv2, Av2, DC, DCv2, Dpdsv5, Dpldsv5, Dpsv5, Dplsv5, Dv4, Dsv4, Ddv4, Ddsv4, Dv5, Dsv5, Ddv5, Ddsv5, Dasv5, Dadsv5	Balanced CPU-to-memory ratio. Ideal for testing and development, small to medium databases, and low to medium traffic web servers.
Compute optimized	F, Fs, Fsv2, FX	High CPU-to-memory ratio. Good for medium traffic web servers, network appliances, batch processes, and application servers.
Memory optimized	Esv3, Ev3, Easv4, Eav4, Epdsv5, Epsv5, Ev4, Esv4, Edv4, Edsv4, Ev5, Esv5, Edv5, Edsv5, Easv5, Easv5, Mv2, M, DSv2, Dv2	High memory-to-CPU ratio. Great for relational database servers, medium to large caches, and in-memory analytics.
Storage optimized	Lsv2, Lsv3, Lasv3	High disk throughput and IO ideal for Big Data, SQL, NoSQL databases, data warehousing and large transactional databases.
GPU	NC, NCv2, NCv3, NCasT4_v3, ND, NDv2, NV, NVv3, NVv4, NDasrA100_v4, NDm_A100_v4	Specialized virtual machines targeted for heavy graphic rendering and video editing, as well as model training and inferencing (ND) with deep learning. Available with single or multiple GPUs.
High performance compute	HB, HBv2, HBv3, HC, H	Our fastest and most powerful CPU virtual machines with optional high-throughput network interfaces (RDMA).

Determine Virtual Machine Storage

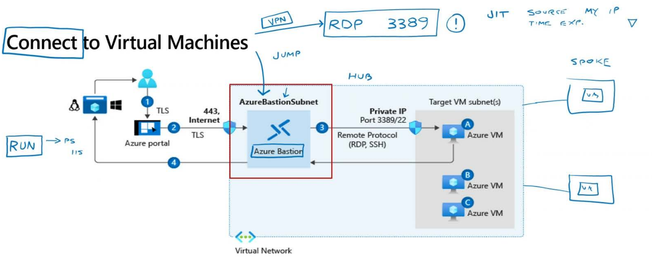
Each Azure VM has two or more disks:
- OS disk ✓
- Temporary disk (not available with all SKUs) ✓
- Data disks (optional) ✓

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

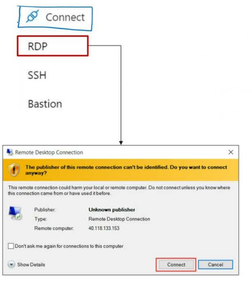
Remote Desktop Protocol for Windows-based Virtual Machines

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



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Demonstration – Creating a VM in the Portal

- Create a virtual machine
- Connect to a virtual machine with Bastion

Your organization has a security policy that prohibits exposing RDP ports to the outside world. You need to connect to a virtual machine to install software. What should you do?
Select one.

A) Configure the Bastion service
B) Configure a Guest configuration on the virtual machine
C) Create a custom script extension

za

What is the default network security settings for a new virtual machine?

A) Neither outbound nor inbound requests are allowed.
B) Outbound request is allowed. Inbound traffic is only allowed from within the virtual network.
C) There are no restrictions: all outbound and inbound requests are allowed.

b

You want to run a network appliance on a virtual machine. Which workload option should you choose?

a

A) Compute optimized
B) Memory optimized
C) Storage optimized

8-2- 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
- Learning Recap

Implement and manage Azure compute resources (20-25%): Create and configure virtual machines

- Configure VM availability options
- Deploy and configure VM scale sets

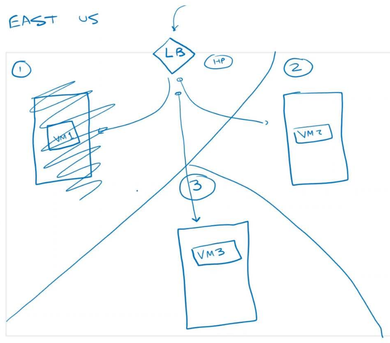
Plan for Maintenance and Downtime

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

Availability Options

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



Availability Zones

The following regions currently support availability zones:

Americas	Europe	Middle East	Africa	Asia Pacific
Brazil South	France Central	Qatar Central	South Africa North	Australia East
Canada Central	Germany West Central	UAE North		Central India
Central US	North Europe			Japan East
East US	Norway East			Korea Central
East US 2	UK South			Southeast Asia
South Central US	West Europe			East Asia
US Gov Virginia	Sweden Central			China North 3
West US 2	Switzerland North			
West US 3				

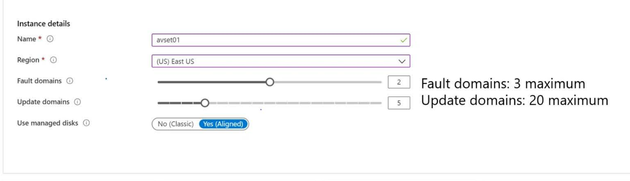
Availability Set: Update and Fault Domains

ONE DC H.C. AI

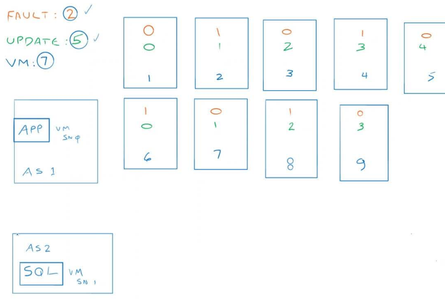
Fault Domains are a group of Virtual Machines that share a common set of hardware, switches, that share a single point of failure. VMs in an availability set are placed in at least two fault domains

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

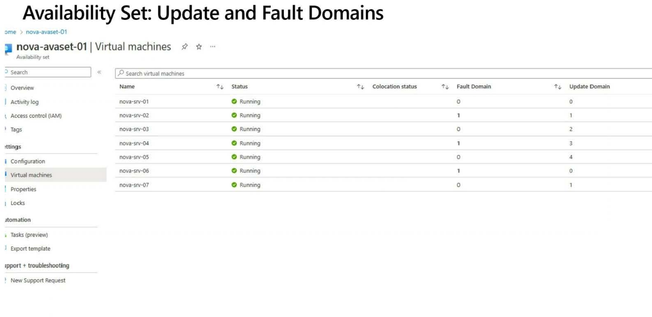
Availability Set



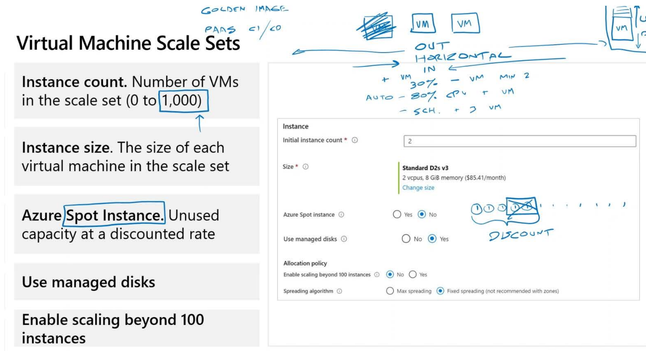
- Configure multiple Virtual Machines in an Availability Set
- Configure each application tier into separate Availability Sets
- Combine a Load Balancer with Availability Sets
- Use managed disks with the Virtual Machines



Availability Set: Update and Fault Domains



Virtual Machine Scale Sets



Instance count. Number of VMs in the scale set (0 to 1,000)

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

Azure Spot Instance. Unused capacity at a discounted rate

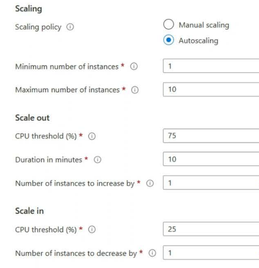
Use managed disks

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



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Multiple choice

An IT administrator creates an Azure virtual machine scale set with 5 VMs. Later, you notice that the VMs are all running at max capacity and the CPU is fully consumed. You need to ensure that additional VMs are deployed automatically when the CPU is running at 75%. What should you do?
Select one.

A) Enable the autoscale option.
B) Increase the instance count.
C) Add the scale set automation script to the library.

q

Your company is preparing to deploy an application to Azure. The app is a self-contained unit that runs independently on several servers. The company is moving the app to the cloud to provide better performance. The team requests if the CPU across the servers goes above 85%, a new VM should be deployed. If the CPU across the servers drops below 15%, an Azure VM running the app should be decommissioned to reduce costs. You need to deploy a solution to meet the requirements while minimizing the administrative overhead to implement and manage the solution.
What should you do? Select one.

A) Deploy the app in a virtual machine scale set.
B) Deploy the app in a virtual machine availability set.
C) Deploy the app by using a resource manager template.

a

Your company is deploying a critical business application to Azure. The uptime of the application is of utmost importance. The application has two web servers, two application servers, and two database servers.
Each VM is in a tier and must run on different hardware so uptime can be maximized. All servers must run in the same data center.
What should you do? Select one.

A) Deploy 1 VM from each tier into one availability set and the remaining VMs into a separate availability set.
B) Deploy the VMs from each tier into a dedicated availability set for the tier.
C) Deploy the application and database VMs in one availability set and the web VMs into a separate availability set

b

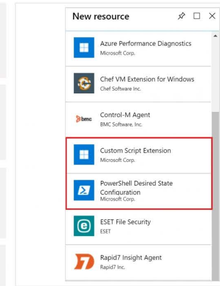
Implement Virtual Machine Extensions

Extensions are small applications that provide post-deployment VM configuration and automation tasks

Managed with Azure CLI, PowerShell, Azure Resource Manager templates, and the Azure portal

Bundled with a new VM deployment or run against any existing system

Different for Windows and Linux machines




```
Install-WindowsFeature -Name Web-Server -IncludeManagementTools
Add-Content -Path 'C:\inetpub\wwwroot\iisstart.htm' -Value "--- $env:computername ---"
```