Microsoft Azure Administrator Associate Training (AZ-104)

Module 4

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02 What is Azure Virtual Machine

03 Configurations of Azure VM

04 Data Disks in Azure

05 Azure VMs and Network Interfaces

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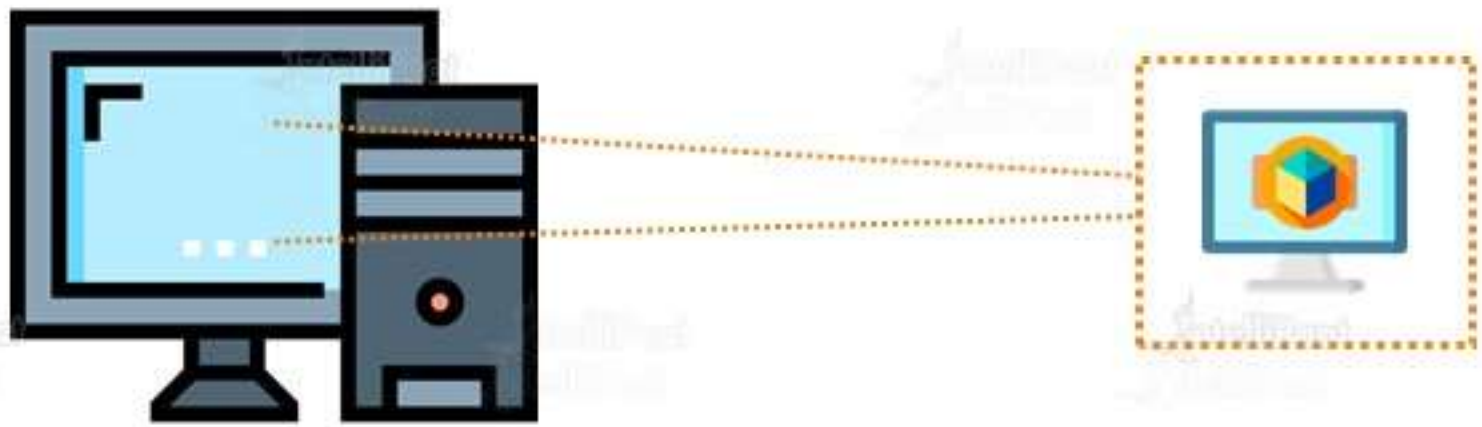
What is a Virtual Machine?

What is a Virtual Machine?

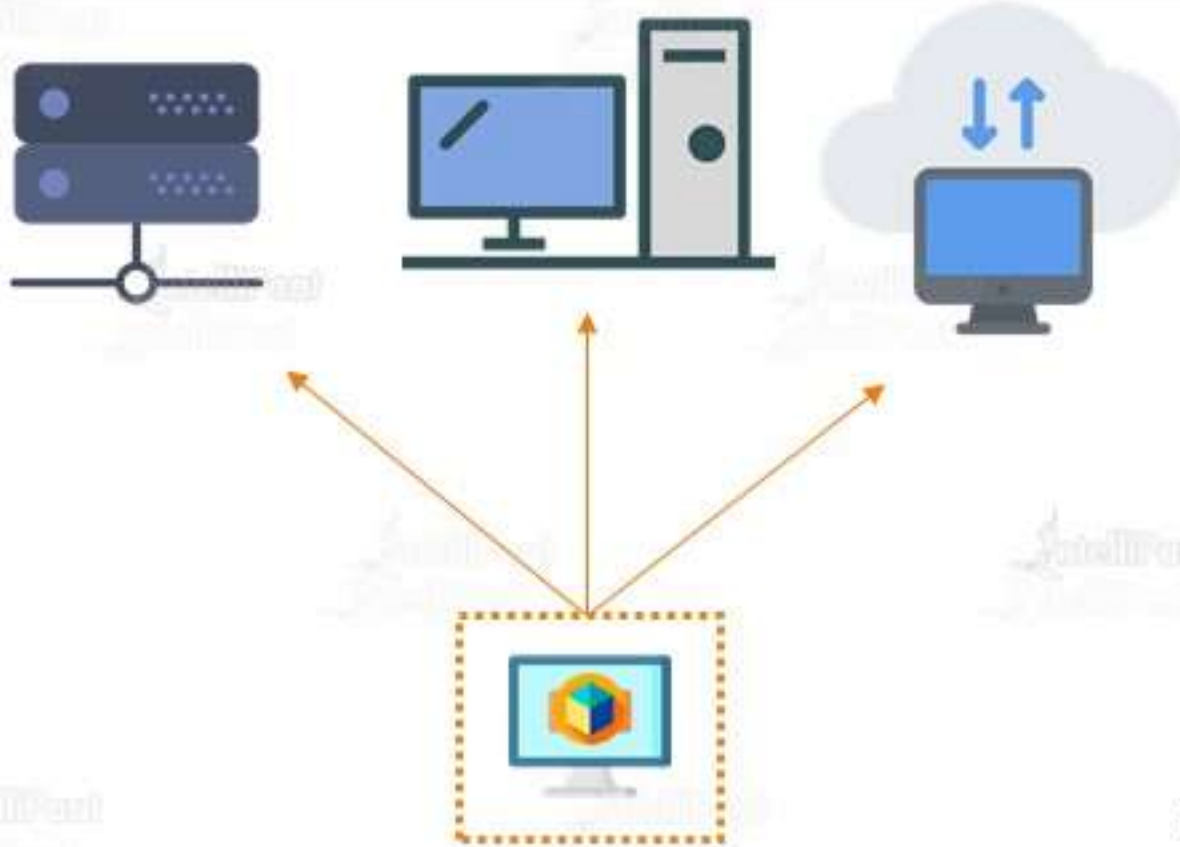
A virtual machine (VM) is a virtual emulation of a physical computer system. It is a virtual environment that includes components such as CPUs, memory, network interfaces, and more giving end-users the same experience on a virtual machine as they would have on a normal physical computer machine



Physical Computer System **Virtual Machine**

What is a Virtual Machine?

A virtual machine can be created on a physical computer system, and it will be called the host machine. VMs can also be created on servers or in the cloud



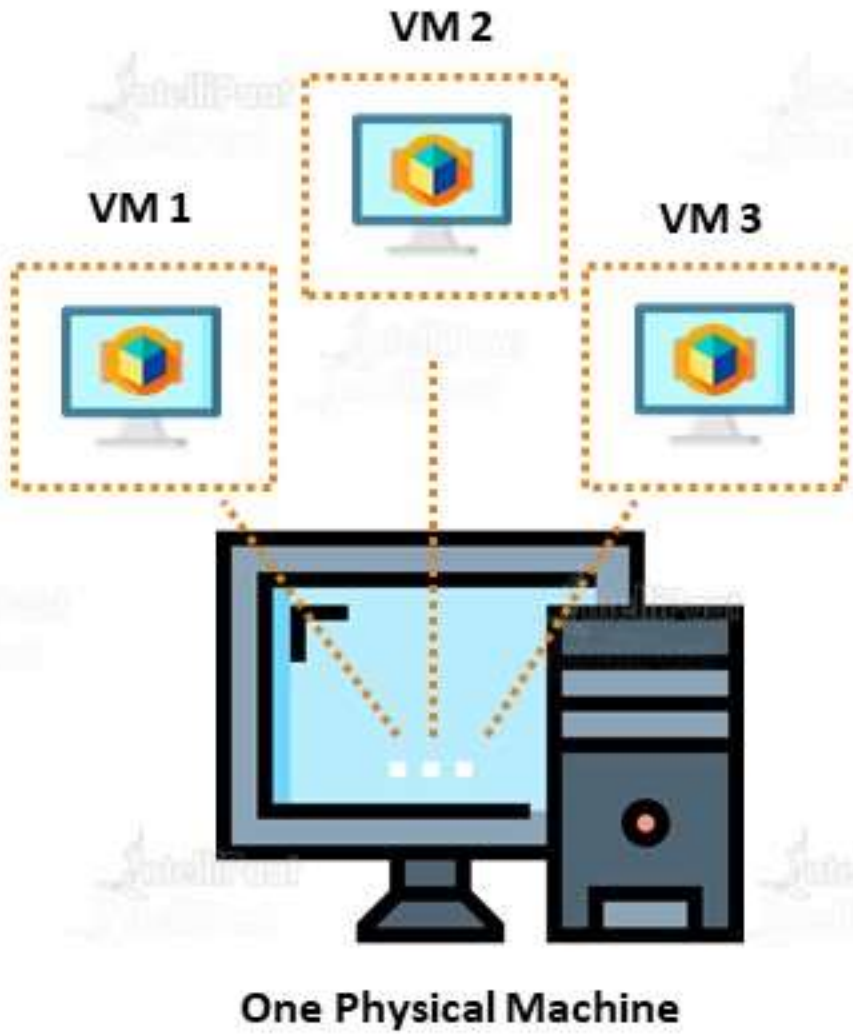
Why use a Virtual Machine?

Virtual Machines can be used to:

Create multiple virtual machines and run all of them on a single physical computer

Create single-purpose servers without actually having to set up a whole physical computer

Create high-availability clusters and minimize downtime



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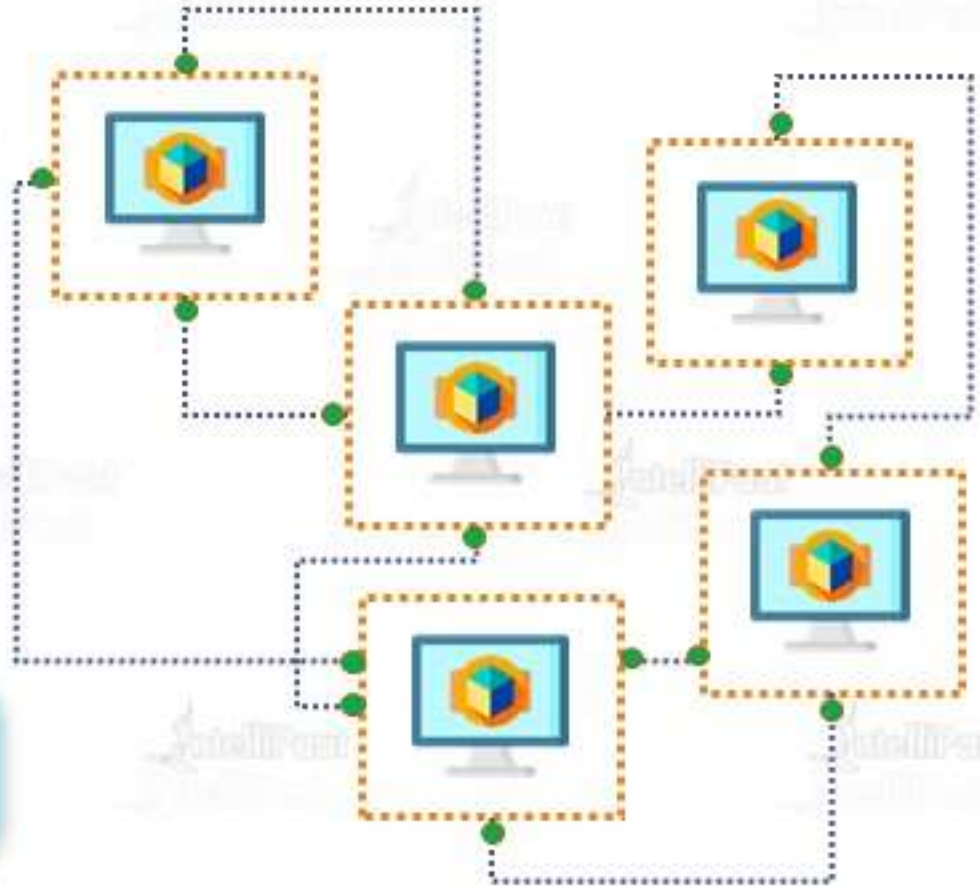


What is Azure Virtual Machine?

What is Azure Virtual Machine?

Azure VM is an IaaS offering from Azure. This service lets us launch VMs in Azure Cloud, hence, giving us the flexibility of virtualization without having to buy and maintain physical hardware

What is Azure Virtual Machine?

Azure offers different types of VMs, categorized based on memory storage and compute types

Types of Azure Virtual Machines

Types of Azure Virtual Machines

A Series VM

This VM is used for entry-level workloads like development and test machines. It is economical and provides low-cost options

D Series VM

This type of VM is used to run applications with high compute power and temporary disk performance

F Series VM

F series VMs are optimized for intensive workloads, and they provide higher CPU-to-memory ratio

G Series VM

This is a storage or memory-optimized VM, offering 2 times more memory and 4 times more storage than the D series

H Series VM

H series virtual machines are the next-generation high-performance computing virtual machines

L Series VM

These are storage-optimized virtual machines. They are ideal for the applications that require low latency

M Series VM

These are the largest memory-optimized VMs. They are ideal for heavy in-memory workloads like SAP HANA

N Series VM

N series virtual machines are GPU-enabled (graphic processing unit-enabled) virtual machines

Types of Azure Virtual Machines

Types	Size	Description
Compute-optimized	Fsv2, Fs, F	Used in medium-traffic web servers, network appliance, batch process, and application servers. Below VM sizes are available in these VMs
Memory-optimized	Esv3, Ev3, M, GS, G, DSv2, DS, Dv2, D	Used in relational database servers, medium-to-large caches, and in-memory analytics. Below VM sizes are available in these VMs
Storage-optimized	Ls	Provide high-disk throughput and IO and is ideal for Big Data, SQL, and NoSQL databases. Ls series is only available in this type of VM sizes, which offers up to 32 vCPUs
GPU-optimized	NV, NC, NCv2, ND	Provide high-graphic performance, and these sizes are designed for compute-intensive, graphic-intensive, and visualization workloads
High-performance Compute	H, A8-11	Use hardware designed and optimized for compute- and network-intensive apps, including high-performance computing (HPC) cluster apps, modeling, and simulations

Hands-on: Creating and Configuring a Basic Azure VM Using Azure Portal

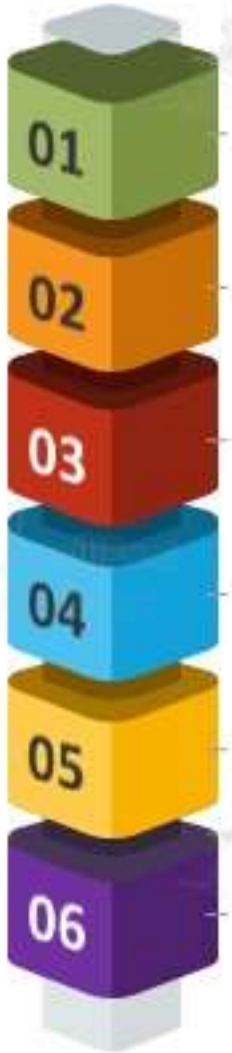
Hands-on

1. Create a Virtual Machine using the Azure Portal

    a) Connect to the machine and Run some basic commands

Overview of the Configurations of Azure VMs

Azure VM Configurations



Basics

Minimal amount of information that is asked to create a VM such as subscription, region, resource group, etc.

Networking

Networking-based configurations for our VM, e.g., if we want a public IP or not or if we want to open ports to enable different types of access to the VM

Guest Config

To congiure our VM to run some custom scripts. We can also use VM extensions

Disks

To configure any data disk we might want with our VM, along with letting us select the level of service those disks may serve

Management

To manage and monitor our VM. We can choose to have our VM automatically shut down, enable automated backup, and more

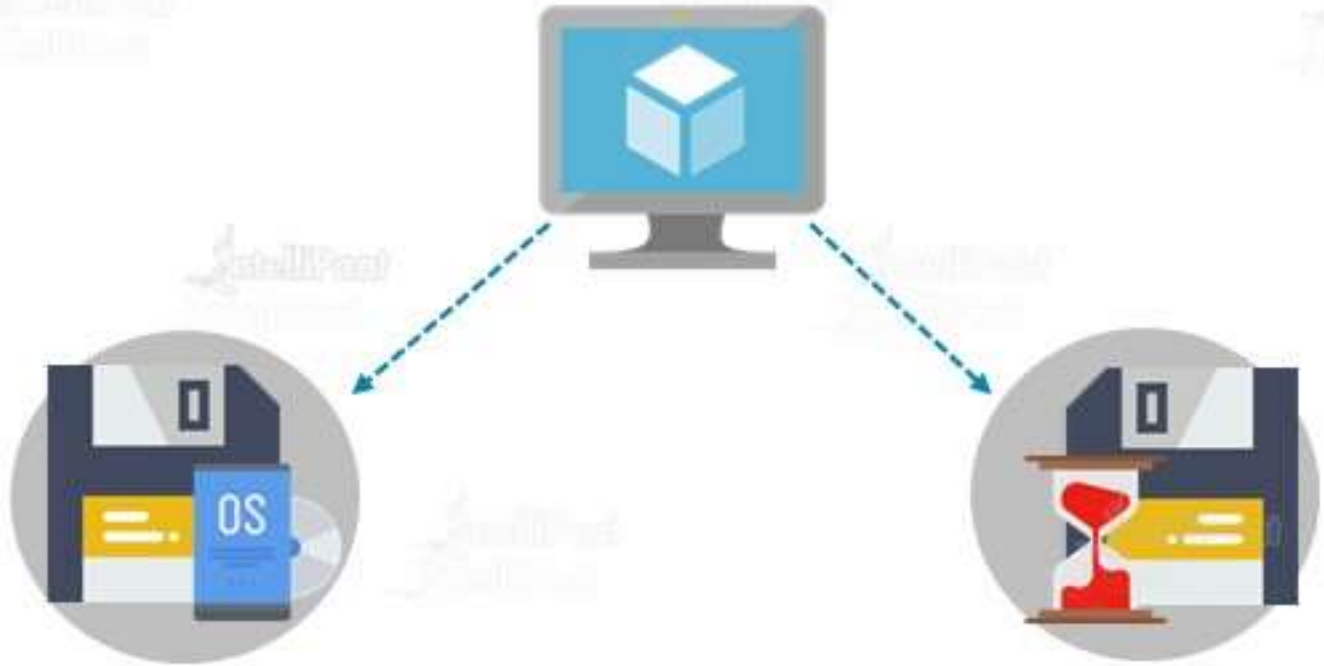
Tags

To set key–value pairs or labels to put on our VMs, making it easy to organise and filter our VMs later

Data Disks in Azure VMs

Disks in Azure Virtual Machines

Virtual machines in Azure use disks as a place to store an operating system, applications, and data. All Azure virtual machines have at least two disks



Operating System Disk

Temporary Disk

Disks in Azure Virtual Machines

Operating System Disk

01

- The OS disk is created from an image and is stored in an Azure Storage account
- There's only one OS disk per VM
- It is labeled as **C: drive** for Windows and as **/dev/sda** for Linux by default
- This disk has a maximum capacity of 2048 GB

Temporary Disk

02

- The temporary storage provided with each VM has no extra cost associated with it for storage space and for transactions
- Data on this disk will be lost, when we resize, shutdown, or restart our VM or when it is moved to a different host server
- During a standard reboot of the VM, the data on the temporary drive should persist

What are Data Disks in Azure?

Data disks are analogous to a hard disk used in regular physical computers. Data disks behave like a virtual hard disk for our virtual computer deployed on Azure Cloud

Virtual Hard Disks

Disks we attach to Azure VMs are stored as Virtual Hard Disk (VHD) files within an Azure Storage account

Number of Data Disks

The maximum number of disks is determined by the size of the VM

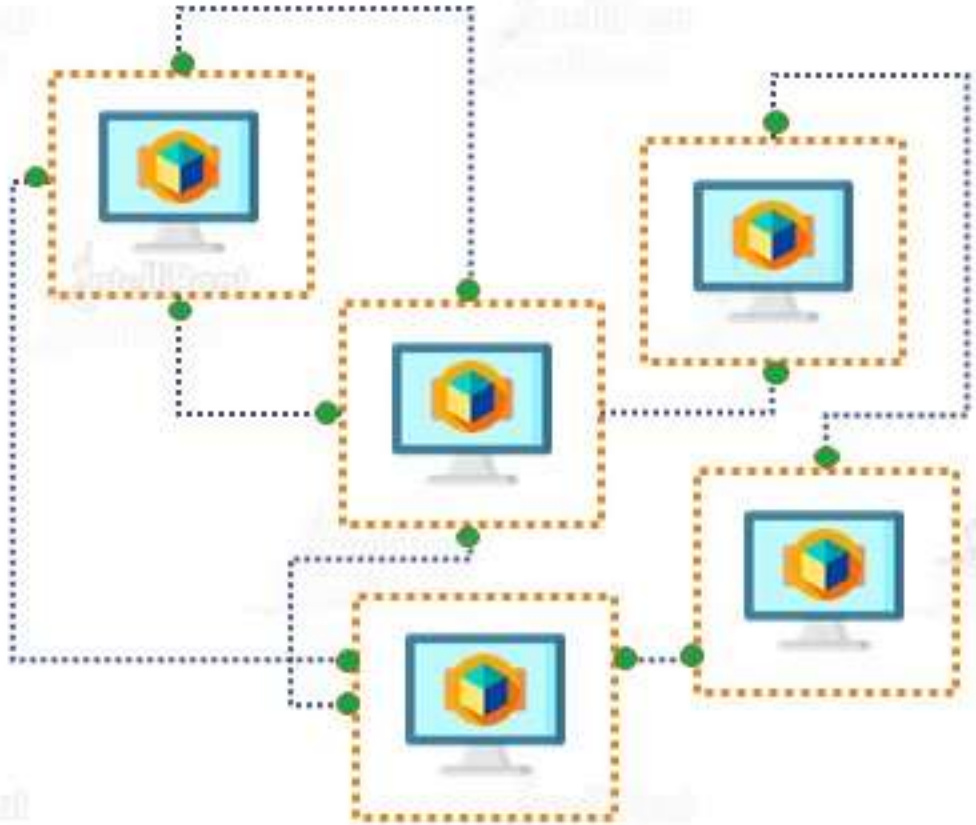
Data Disk Capacity

Each data disk has a maximum capacity of 4095 GB

What are Azure VM Scale Sets?

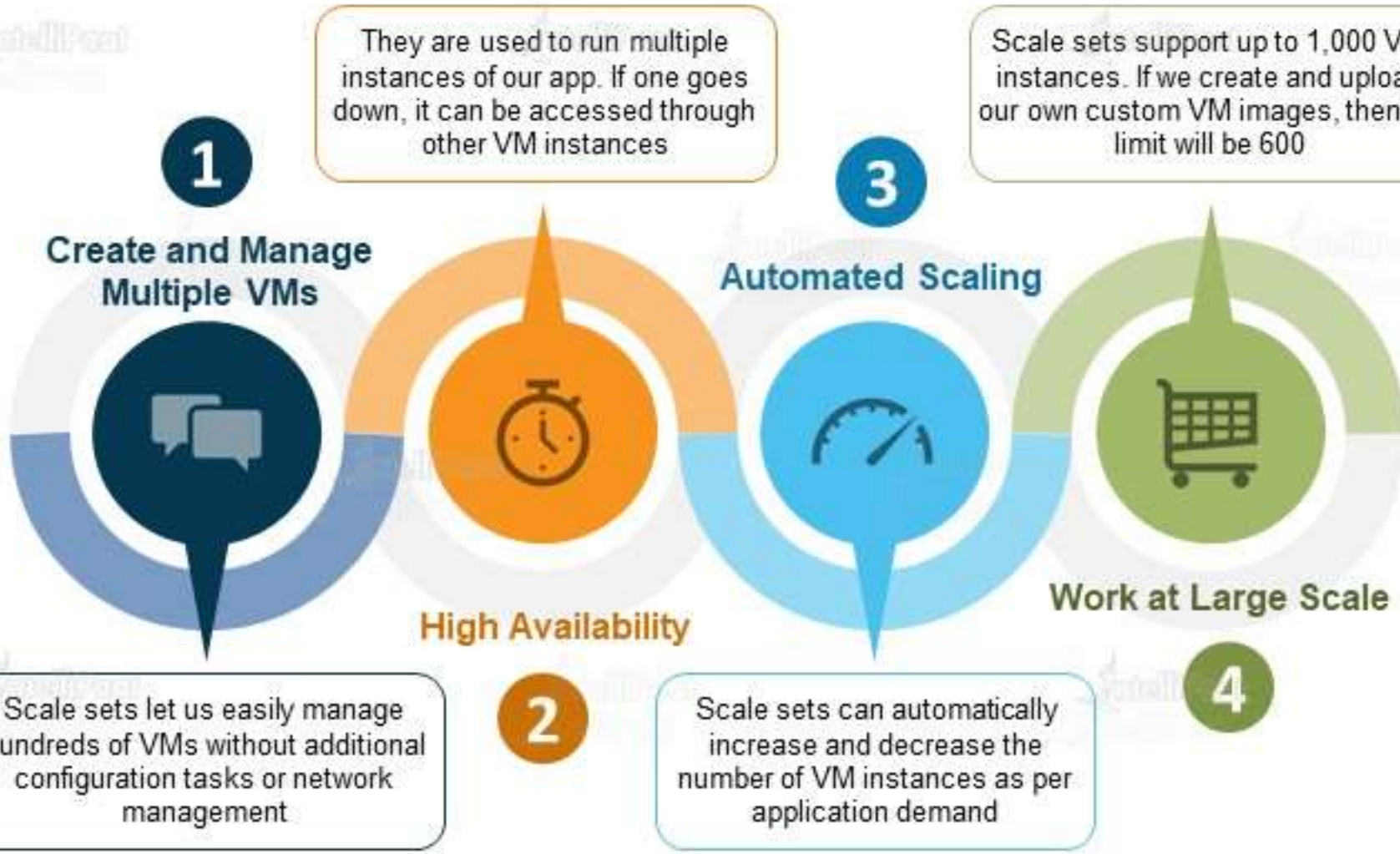
What are Azure VM Scale Sets?

Azure virtual machine scale sets let us create and manage a group of identical, load-balanced VMs. The number of VM instances can automatically increase or decrease in response with the demand or with a defined schedule



Why Use Virtual Scale Sets?

Why Use Virtual Scale Sets?



Hands-on: Creating a Scale Set

Hands-on

1. Create a Scale Set on the Azure portal

    a) Set the default value for Minimum and Maximum number of VMs.
    b) Scale out - 75% CPU Usage – Add 1 VM
    c) Scale in – 25% CPU Usage – Delete 1 VM

2. Test the scale set using the Virtual Machine

Availability Sets

Availability sets is a feature provided by Microsoft Azure mainly for **business continuity** and **high availability**

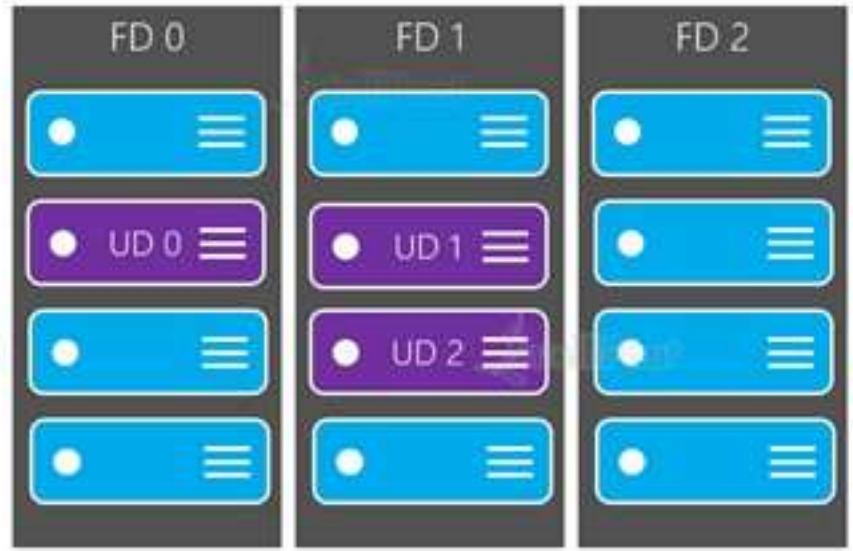
It ensures that Azure VMs are deployed across multiple isolated hardware nodes in a cluster such that, if a failure happens only a subset of your Virtual Machines are impacted, and your overall solution is safe.

Availability Sets: Fault and Update Domains

Availability sets separate the resources into fault domains and update domains

Fault domain define a group of VMs that share a common power source and Network Switch

Virtual machines get **Update domains** automatically once they are put inside availability set.
All virtual machines within that update domain will reboot together



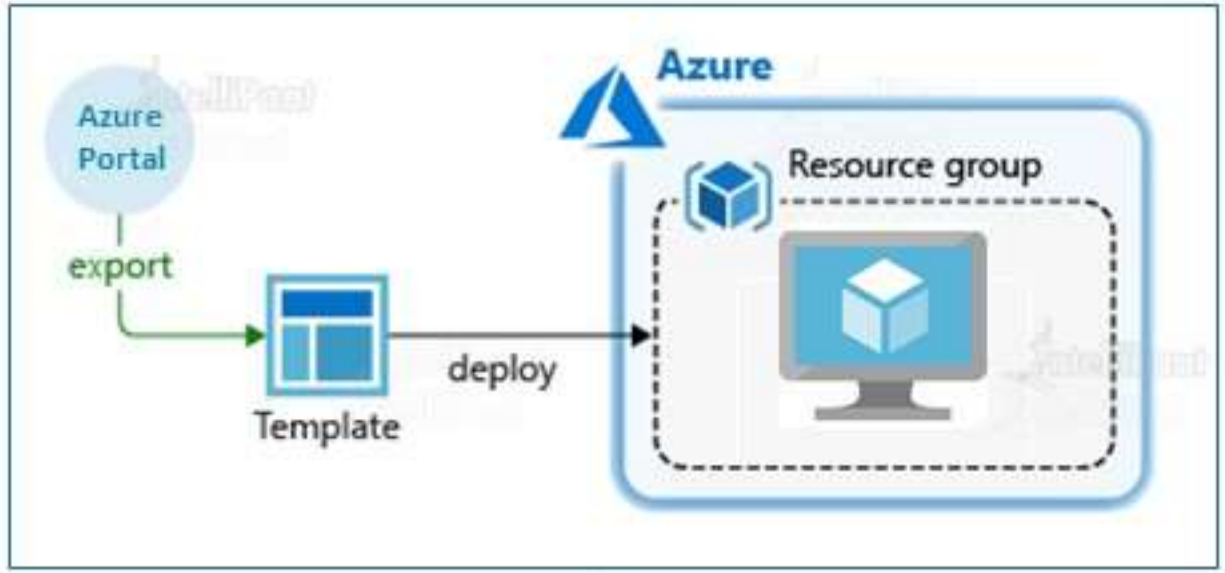
Demo availability set

What is an ARM Template?

What is an ARM Template?

The Azure Resource Manager template is a JSON file that defines a set of resources needed for an application. It also defines dependencies and parameters that enable a user to configure settings for resources while requesting for the them

We can save a deployment as an ARM template and then use this template to automate that deployment, using Azure Portal



What is a VHD Template?

What is a VHD Template?

An Azure-managed disk is called a virtual hard disk (VHD). It is like a physical disk in an on-premises server, but virtualized

We can use VHD to deploy resources in Azure such as VMs in following ways:

01
- We can create a new VM and attach an already existing VHD to it as an OS disk

02
- We can create a new VM from the VHD of a VM that has been deleted

03
- We can create an Azure VM from an on-premises VHD by uploading the on-premises VHD and attaching it to a new VM

Hands-on: Create a VM from a Virtual Disk

Hands-on

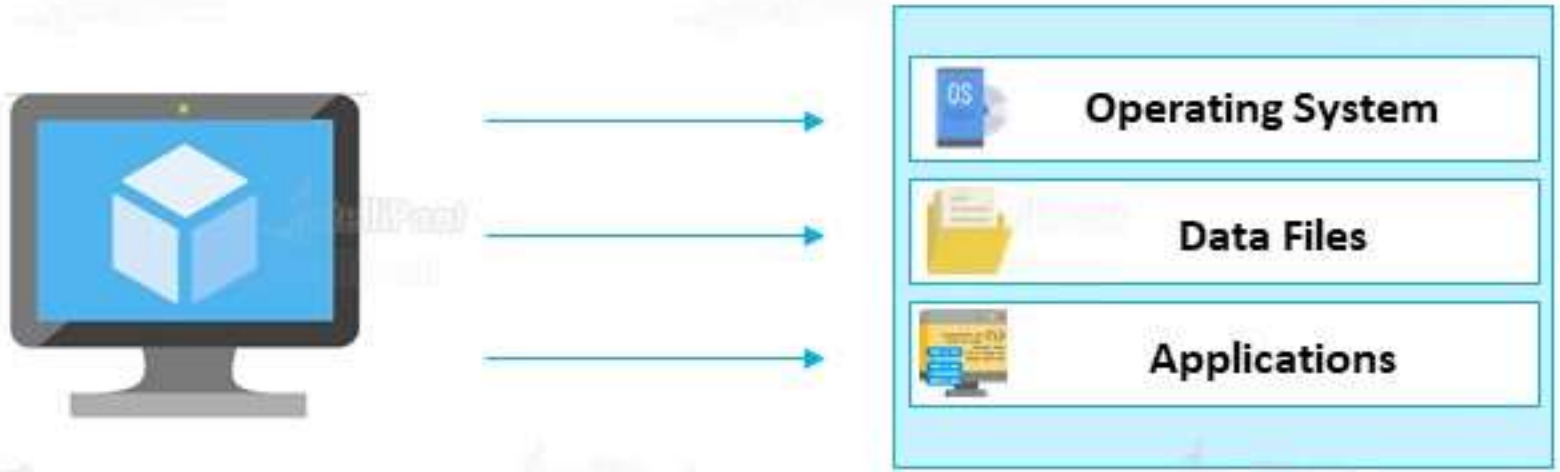
1. Copy an OS Disk from an existing Virtual Machine

2. Create a copy of the disk and use this disk to create a new Virtual Machine

What are Custom Images?

What are Custom Images?

An image is a copy of a VM or a template for creating a VM, which might contain an OS, data files, and applications. Using custom images, we can create a VM



Hands-on: Deploying a VM from a Custom Image

Hands-on

1. Go to the Virtual Machine in the Azure Portal

    a) Capture a Custom Image

2. Use the image to create a new virtual machine

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