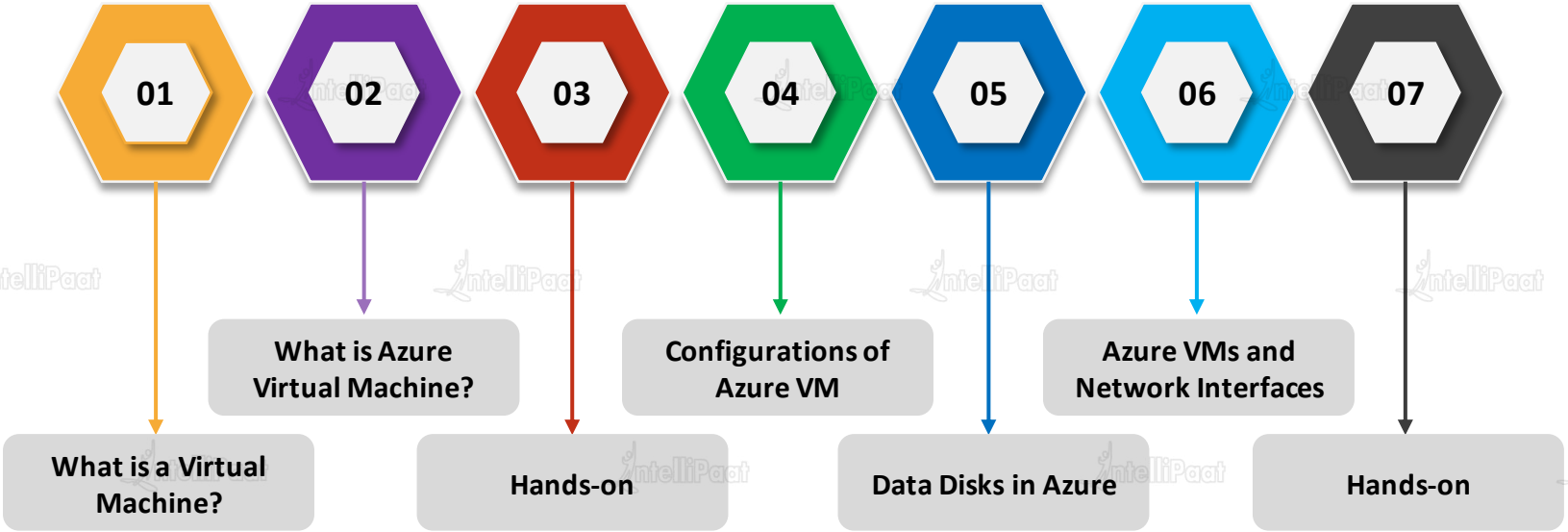
Microsoft Azure Administrator Associate Training (AZ-103)

Module 3

Agenda



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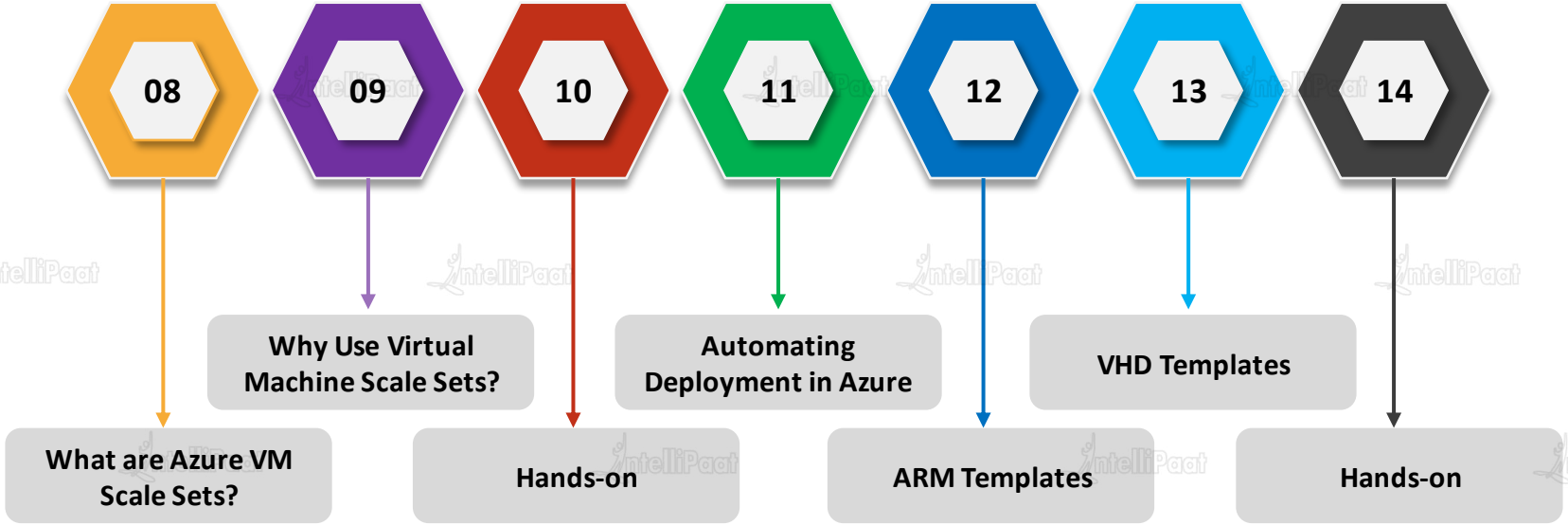

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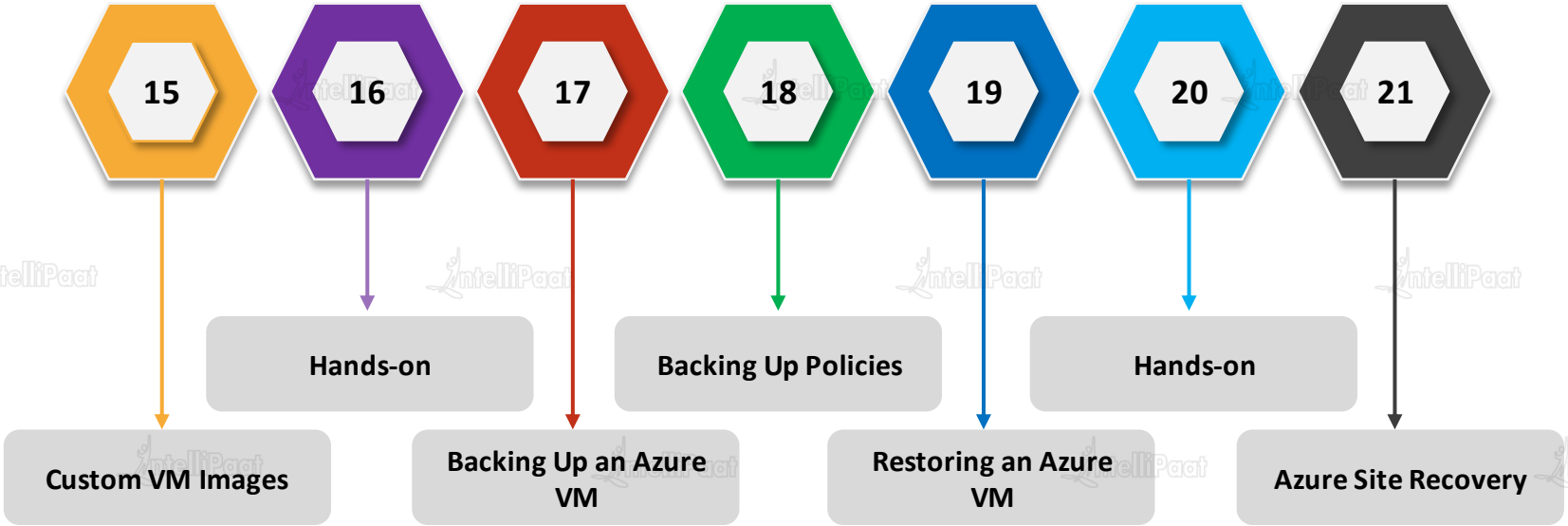
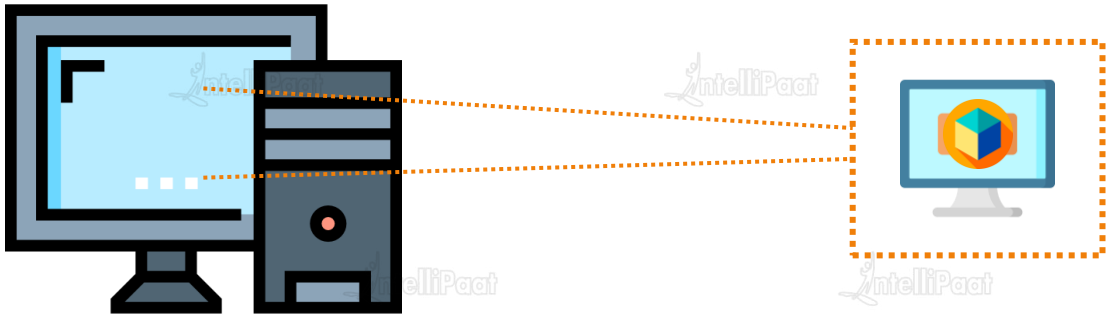


What is a Virtual Machine?

What is a Virtual Machine?

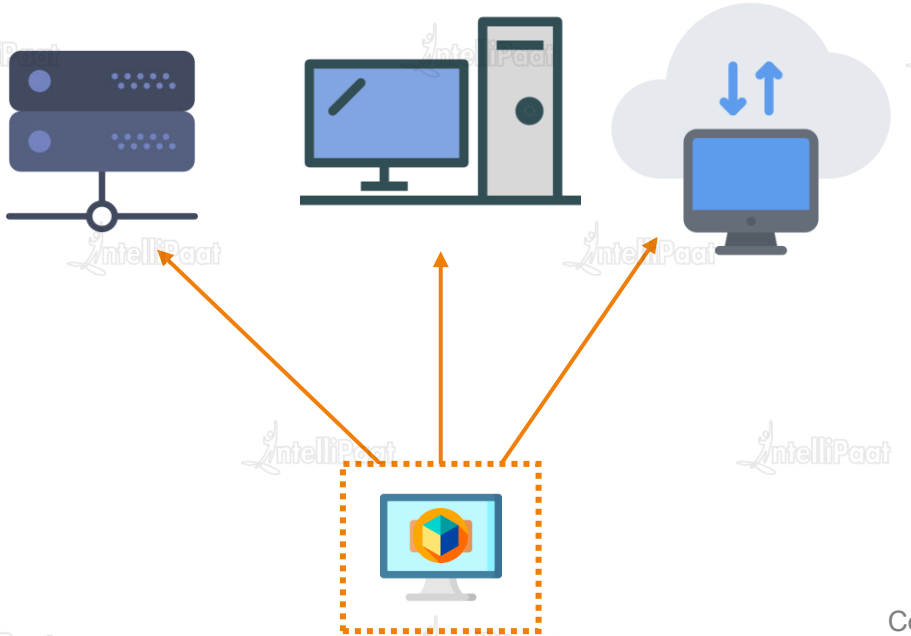
A virtual machine is a virtual emulation of a physical computer system. It is a virtual environment that includes components such as CPUs, memory, network interfaces, and more, giving end users the same experience on a virtual machine as they would have on a normal physical computer machine



Physical Computer System **Virtual Machine**

What is a Virtual Machine?

Virtual machines can be created on another physical computer system, called the host machine. Virtual machines can also be created on servers or in the cloud



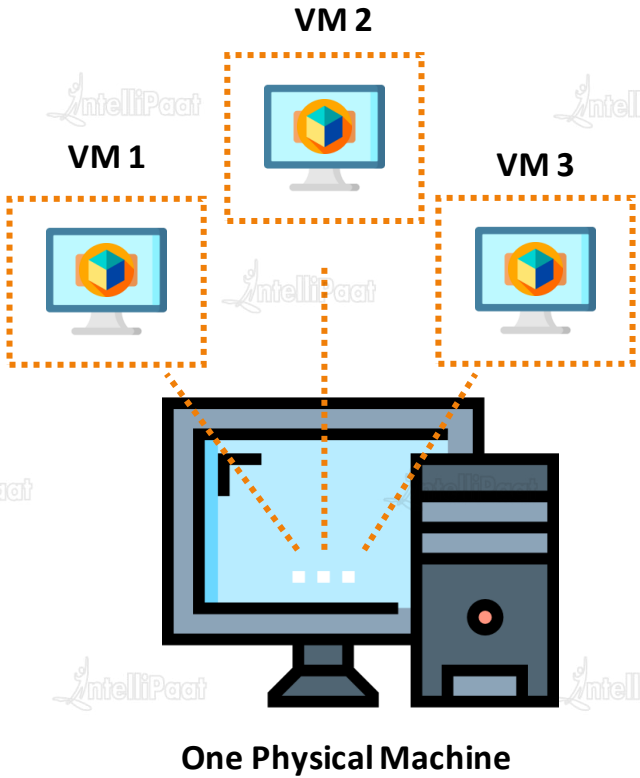
Why would you use a Virtual Machine?

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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Application Testing Server

Database Server

Authentication Server

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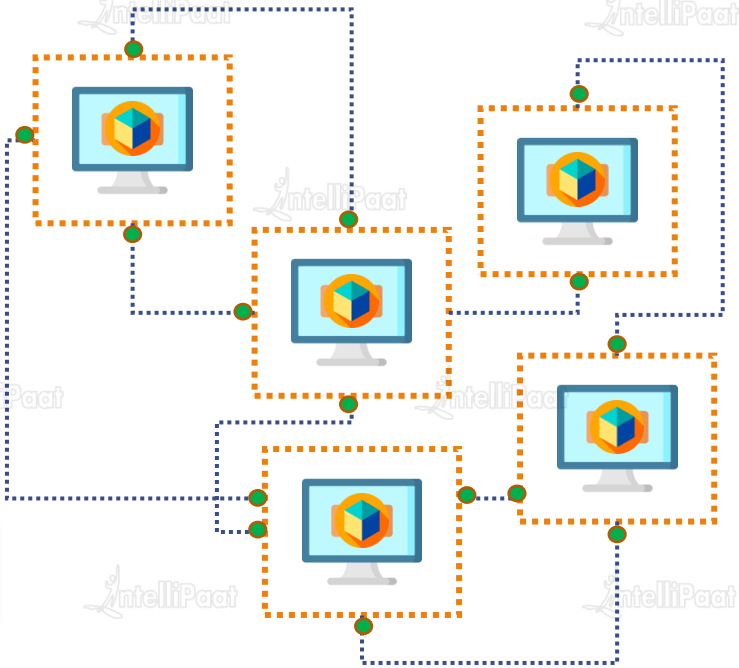
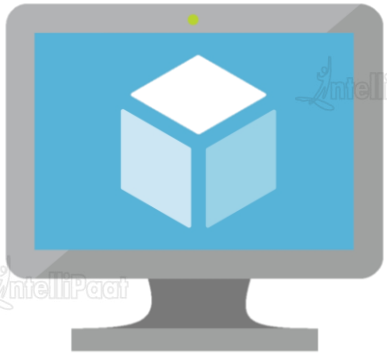


What is Azure Virtual Machine?

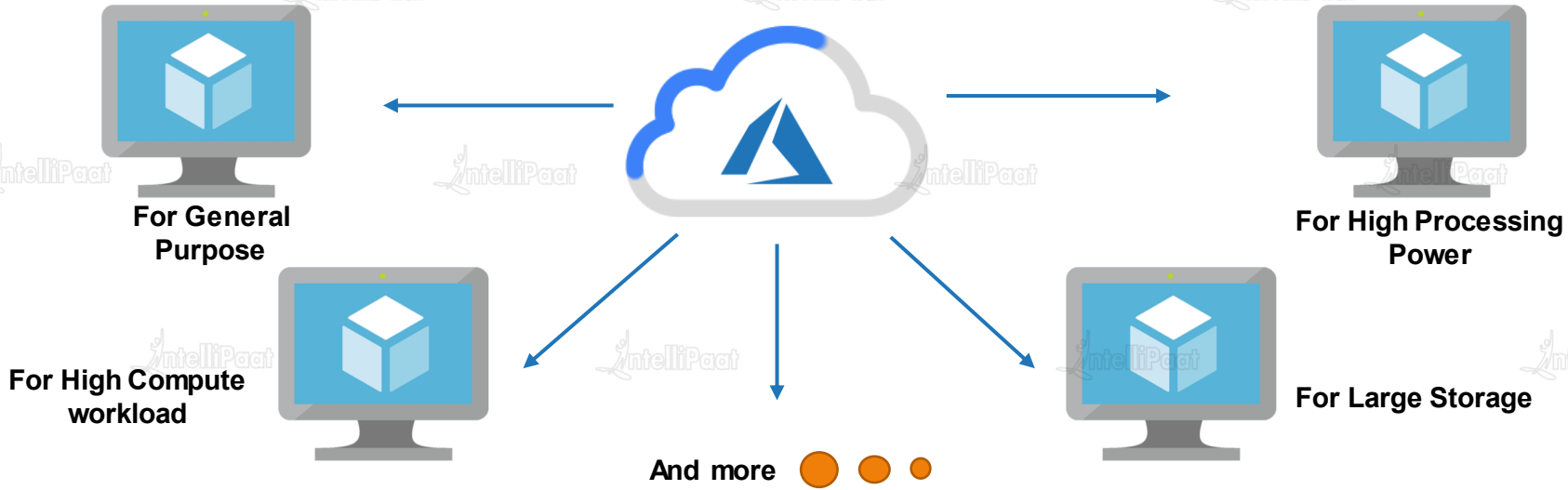
What is Azure Virtual Machine?

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



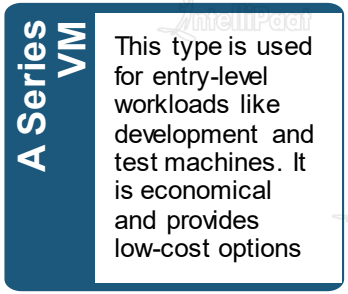
What is Azure Virtual Machine?

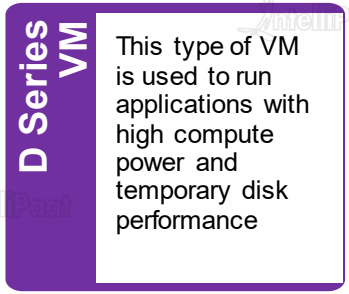
Azure offers different types of virtual machines, categorized on the basis of memory storage and compute types

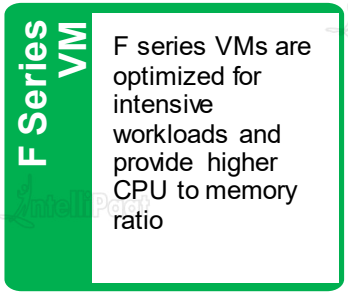


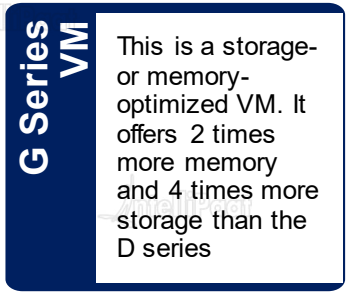
Types of Azure Virtual Machines

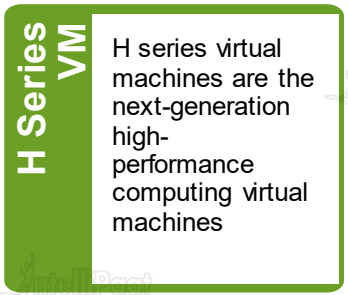
Types of Azure Virtual Machines

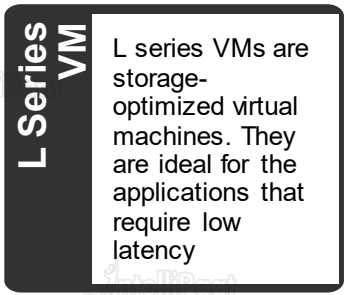


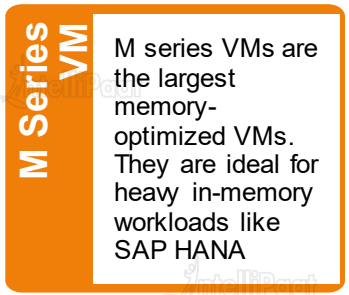


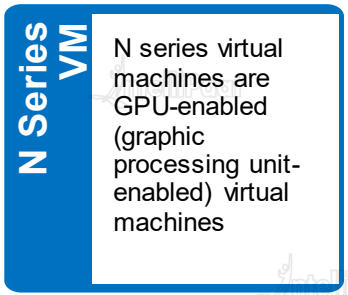












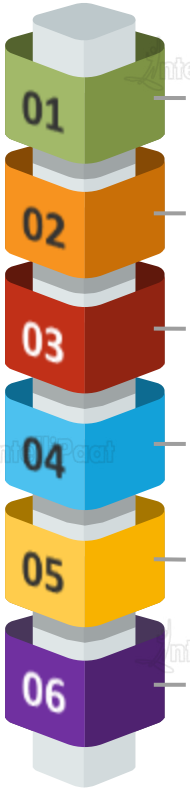
Types of Azure Virtual Machines

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 compute-optimized 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 memory-optimized VMs
Storage-optimized	Ls	This provides high-disk throughput and IO and is ideal for Big Data, SQL, and NoSQL databases. Ls series is only available in storage-optimized VM sizes, which offers up to 32 vCPUs
GPU - Optimized	NV, NC, NCv2, ND	GPU-optimized VMs provide high-graphic performance, and these sizes are designed for compute-intensive, graphic-intensive, and visualization workloads
High-performance Compute	H, A8-11	High-performance compute VMs use hardware designed and optimized for compute-intensive and network-intensive applications, including high-performance computing (HPC) cluster applications, modeling, and simulations

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

Overview of the Configurations of Azure VMs

Overview of the Configurations



Basics

Minimal amount of information that is asked to create a virtual machine such as subscription, region, resource group, and so on

Networking

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

Guest Config

You can use this tab to congiure your VM to run some custom scripts. You can also use VM extensions

Disks

This tab gives you the oppurtunity to configure any data disk you might want with your virtual machine, along with letting you select the level of service those disk may serve

Management

This tab helps you manage and monitor your virtual machine. You can choose to have your VM automatically shut down, enable automated backup, and more

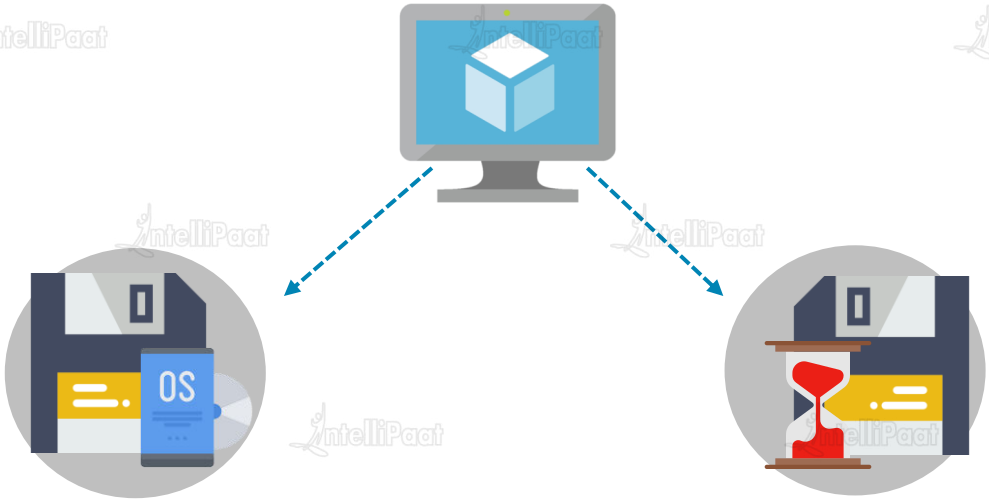
Tags

This tab allows you to set key–value pairs or labels to put on your virtual machines, making it easy to organise and filter your 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 operating system disk is created from an image, and it is stored in an Azure storage account
- There's only one OS disk per VM
- It is labeled as: C: drive for windows & /dev/sda for Linux by default
- This disk has a maximum capacity of 2048 GB

Temporary Disk

02

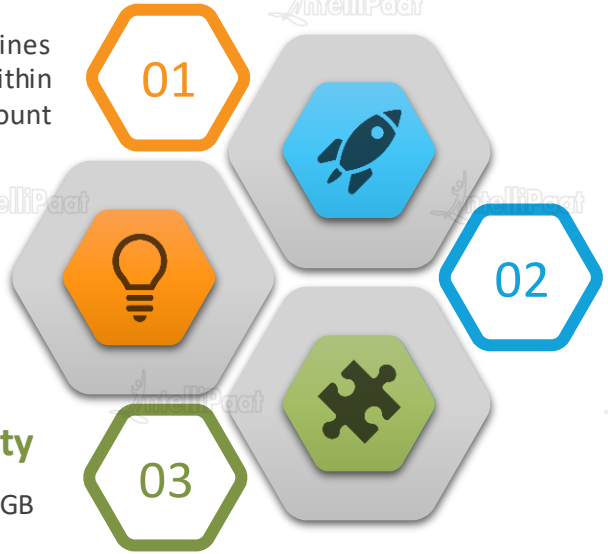
- The temporary storage provided with each VM has no extra cost associated with it for storage space and for transactions
- Data on the temporary drive will be lost, when you resize, shutdown, or restart your VM, moved to a different host server
- During a standard reboot of the VM, the data on the temporary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

What are Data Disks in Azure?

Data disks are analogous to a hard disk that is used with regular physical computers. Data disks behave like a virtual hard disk for your virtual computer deployed on Azure cloud

Virtual Hard Disks

Disks that you attach to Azure virtual machines 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

Data Disks in Azure Virtual Machines

A few facts about disks in Azure Virtual Machines:

01

Azure disks are designed for 99.999% availability

02

A temporary disk is implemented as a local storage on the host where the VM is running

03

Operating system disks and data disks are implemented as blob storage in a storage account

04

Data disks provide persistent storage for applications and data

Managed and Unmanaged Disks

Difference Between Unmanaged and Managed Disks

- You must create Azure storage accounts where these unmanaged Azure VM disks will reside
- The maximum number of Azure storage accounts per region is limited to 200
- When using a standard storage with unmanaged disks, you pay only for the space you use

- Azure platform controls the placement of managed VM disk files
- The limit on the number of storage accounts no longer applies. Although, there is a limit of 10,000 managed disks per region.
- With managed disks, you pay for the full capacity of a disk, regardless of the disk space that is in use

Azure VMs and Network Interfaces

VMs and Network Interfaces

A network interface enables an Azure virtual machine to communicate with the Internet, Azure cloud, and on-premise resources. When you create a virtual machine using Azure Portal, the portal creates one network interface with default settings for you

Alternatively, users can also choose to create network interfaces with custom settings

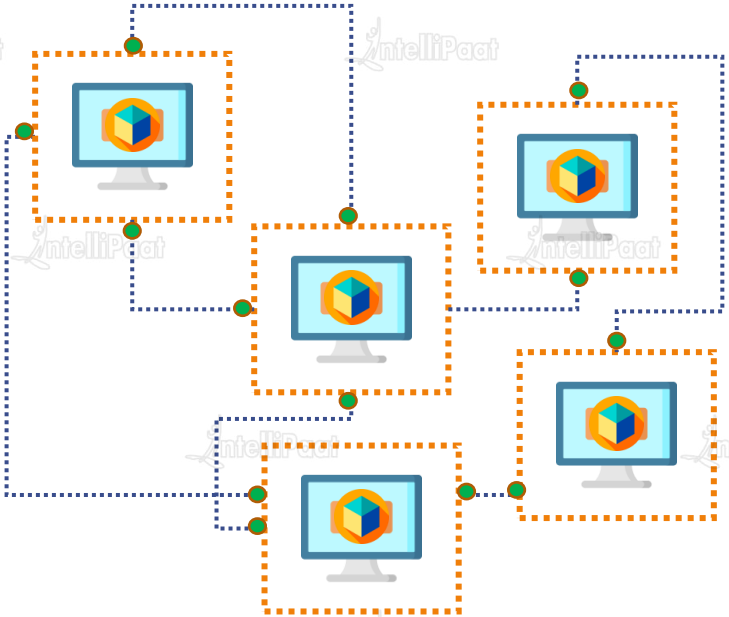
- A VM must have at least one network interface but can have more than one, depending on the size of the VM you create
- Each network interface attached to a VM must exist in the same location and subscription as the VM
- A network interface can exist either in the same or in a different resource group than the virtual machine

Hands-on: Creating and Configuring an Azure Virtual Machine

What are Azure VM Scale Sets?

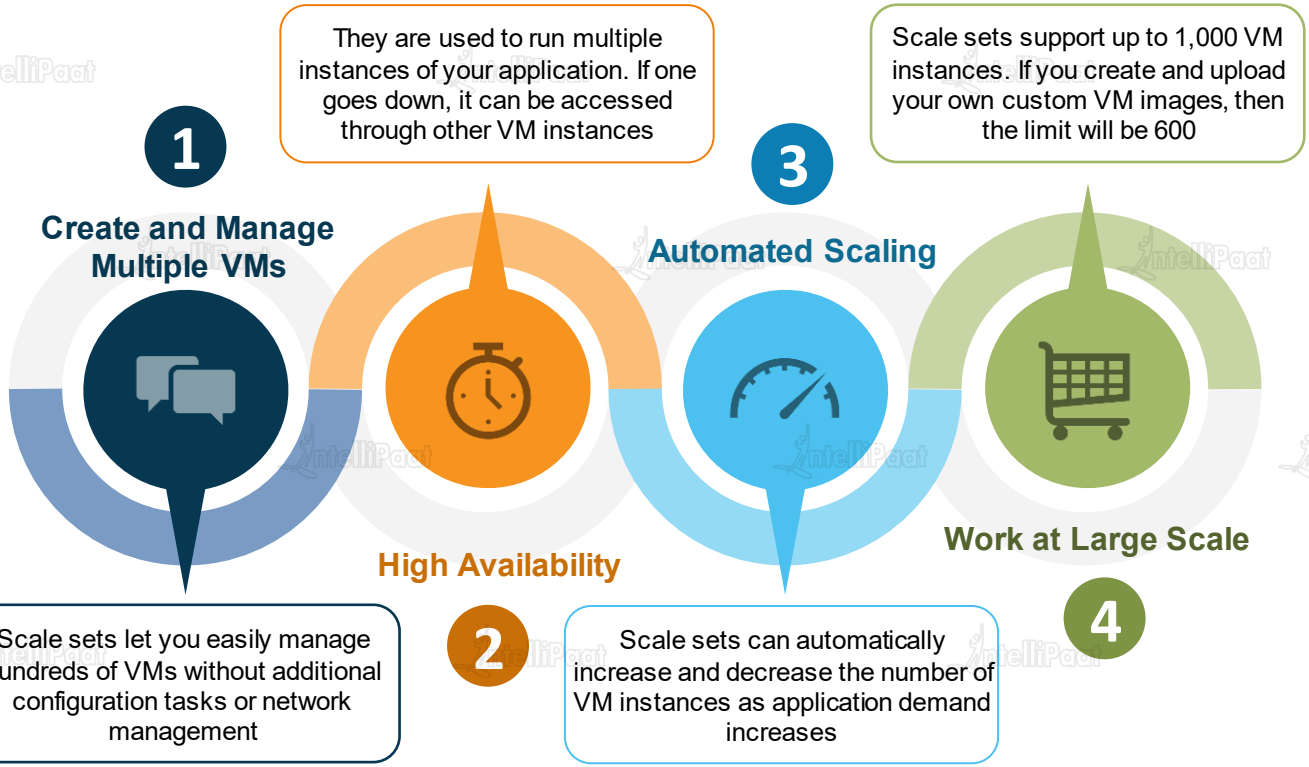
What are Azure VM Scale Sets?

Azure virtual machine scale sets let you 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?



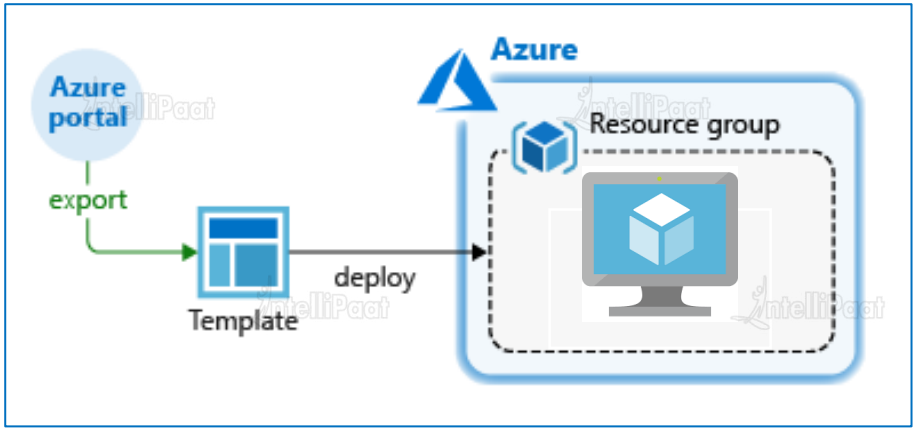
Hands-on: Creating a Scale Set

What is an ARM Template?

What is an ARM Template?

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

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

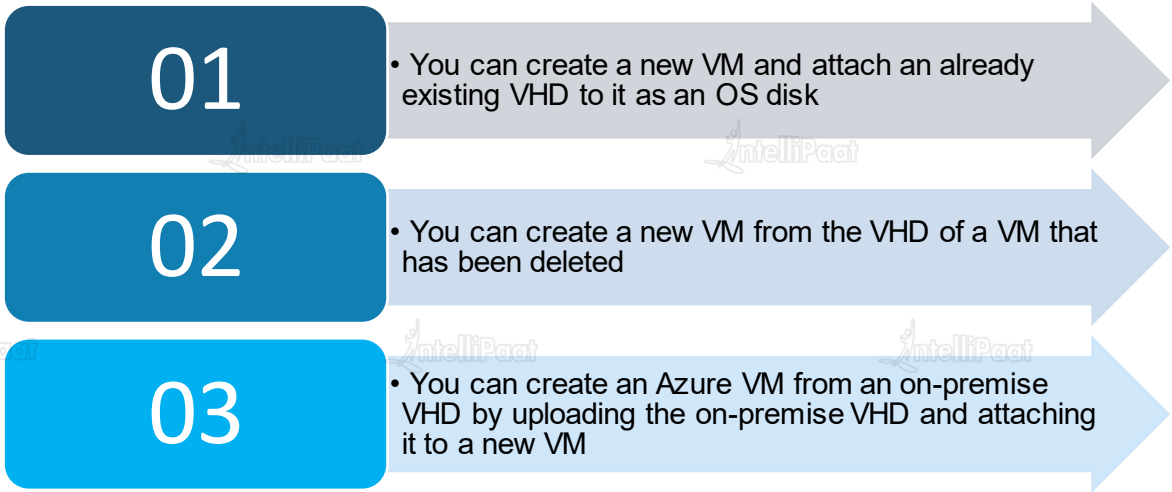


What is a VHD Template?

What is a VHD Template?

An Azure-managed disk is a virtual hard disk (VHD). You can think of it like a physical disk in an on-premises server, but virtualized

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

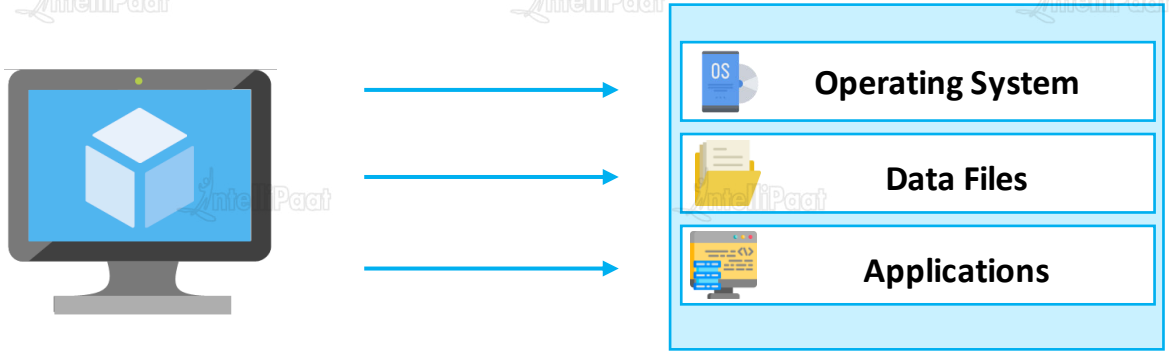


Hands-on: Creating a VM from a Virtual Disk

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 these custom images, you can create a VM



Hands-on: Deploying a VM from a Custom Image

Backing Up an Azure VM

What is Azure Backup Service?

Azure offers a built-in backup service that lets users backup their data to the Microsoft Azure Cloud. This service can also be used to take on-point backup of Azure VMs

VM backups in Azure are stored in Recovery Service vaults. You can access these Recovery Service vaults through Azure Portal

- Azure gives full flexibility to configure and modify a VM backup
- You can choose when to create a backup according to the time that works best for you
- You can enable a backup for as long as you want
- Recovery Service vaults are connected to your storage account and scale automatically to accommodate your backup
- Azure backup is a pay-as-you-go service, i.e., you only pay for the storage amount that you use

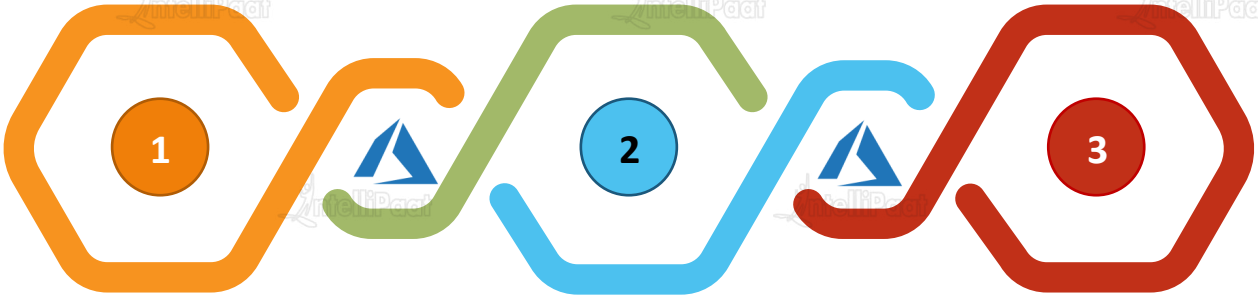
Restoring a Backup

Create a New VM

Quickly creates and gets a basic VM up and running from a restore point. You can specify a name for the VM and a storage account for the restored VM

Replace the Existing

You can restore a disk and use it to replace the disk on the existing VM. The current VM must exist. If it's being deleted, this option can't be used



Restore the Disk

Restores a VM disk, which can then be used to create a new VM. Alternatively, you can attach the disk to an existing VM

Hands-on: Backing up and Restoring an Azure Virtual Machine

Azure Site Recovery

What is Azure Site Recovery?

Azure Site Recovery is a disaster recovery solution offered by Azure. This service makes sure that your data or workloads are available even during the outages

01

Site Recovery replicates workloads running on physical and virtual machines (VMs) from a primary site to a secondary location

02

When an outage occurs at your primary site, you failover to the secondary location and access apps from there. Once the primary location starts running again, you can failback to it

Quiz

1. Where are the operating disks and data disks stored?

A. As a blog storage in a storage account

B. Operating disks as a blob storage, while data disks as a local storage

C. Data disks as a blob storage, while operating disks as a local storage

D. None of the above

Quiz

2. What is an ARM template?

A. A JSON file defining resources and dependencies

B. An Azure tool to access the Azure platform

C. A PHP file defining resources and dependencies

D. None of the above

Quiz

3. You can deploy resources using an ARM template.

A. True

B. False

Quiz

4. Which of the following is correct?

A. An Azure-managed disk is a virtual hard disk (VHD) that can be used to deploy VMs

B. An Azure-managed disk is a virtual hard disk (VHD) that can only be used to store data

C. VHD template is another name for ARM template

D. None of the above

Quiz

5. Azure VM backup is the same as Azure VM restore.

A. True

B. False

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