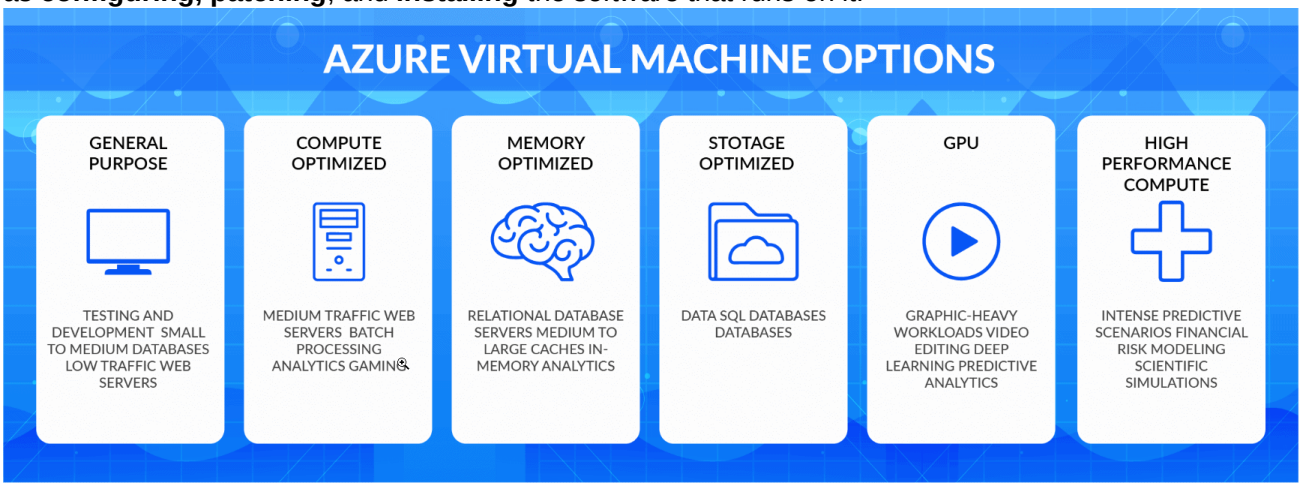
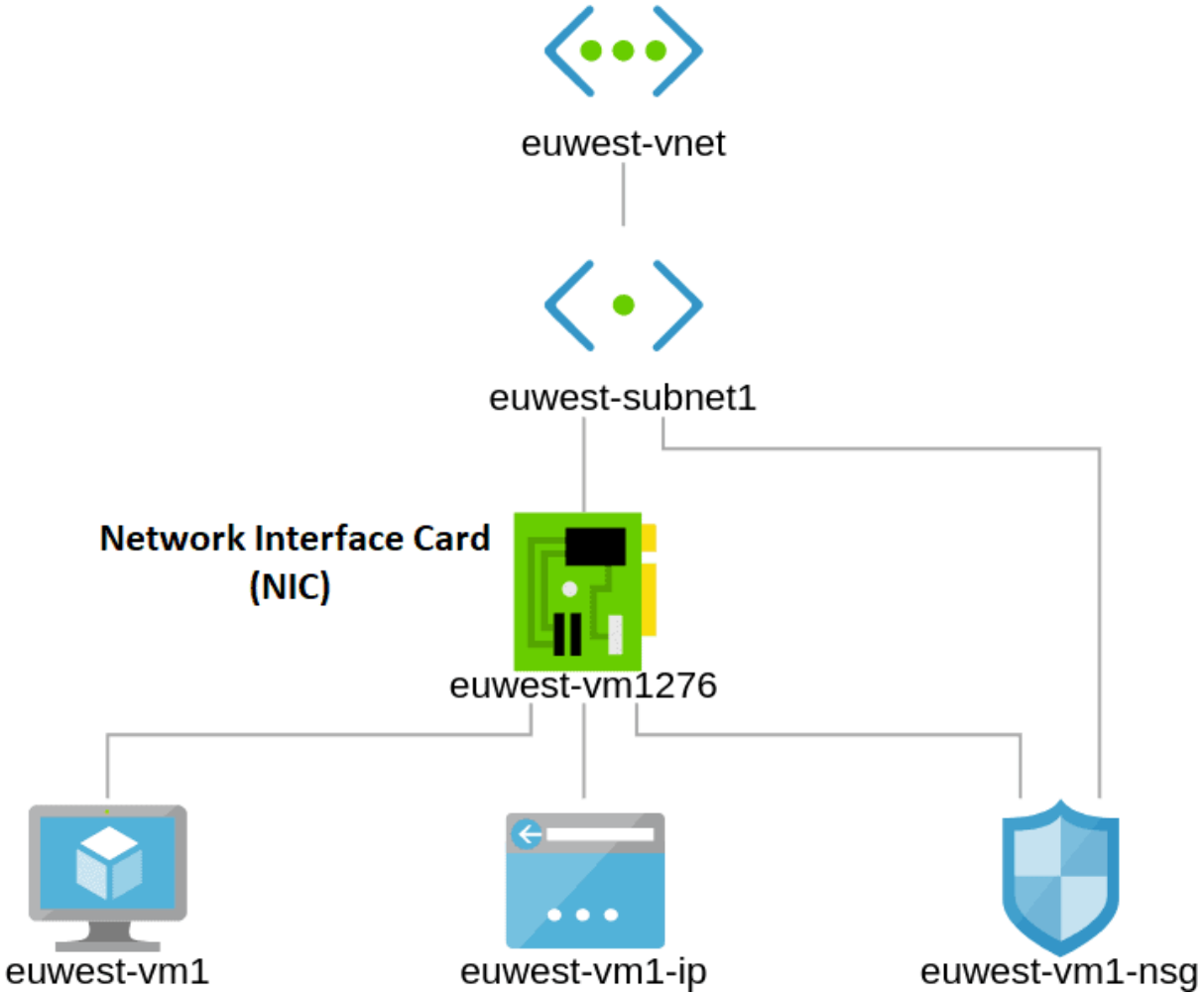
Azure Virtual Machines

A Virtual Machine (VM) is a **computing** service that performs most functions of a physical computer, actually behaving like a separate computer system. A virtual machine, usually known as a guest, is created within another computing environment (i.e., Physical Datacenters) referred to as a "**host"**
An Azure VM gives you the flexibility of virtualization without having to buy and **maintain** the physical hardware that runs it. However, you still need to maintain the VM by performing tasks, such as **configuring, patching**, and **installing** the software that runs on it.



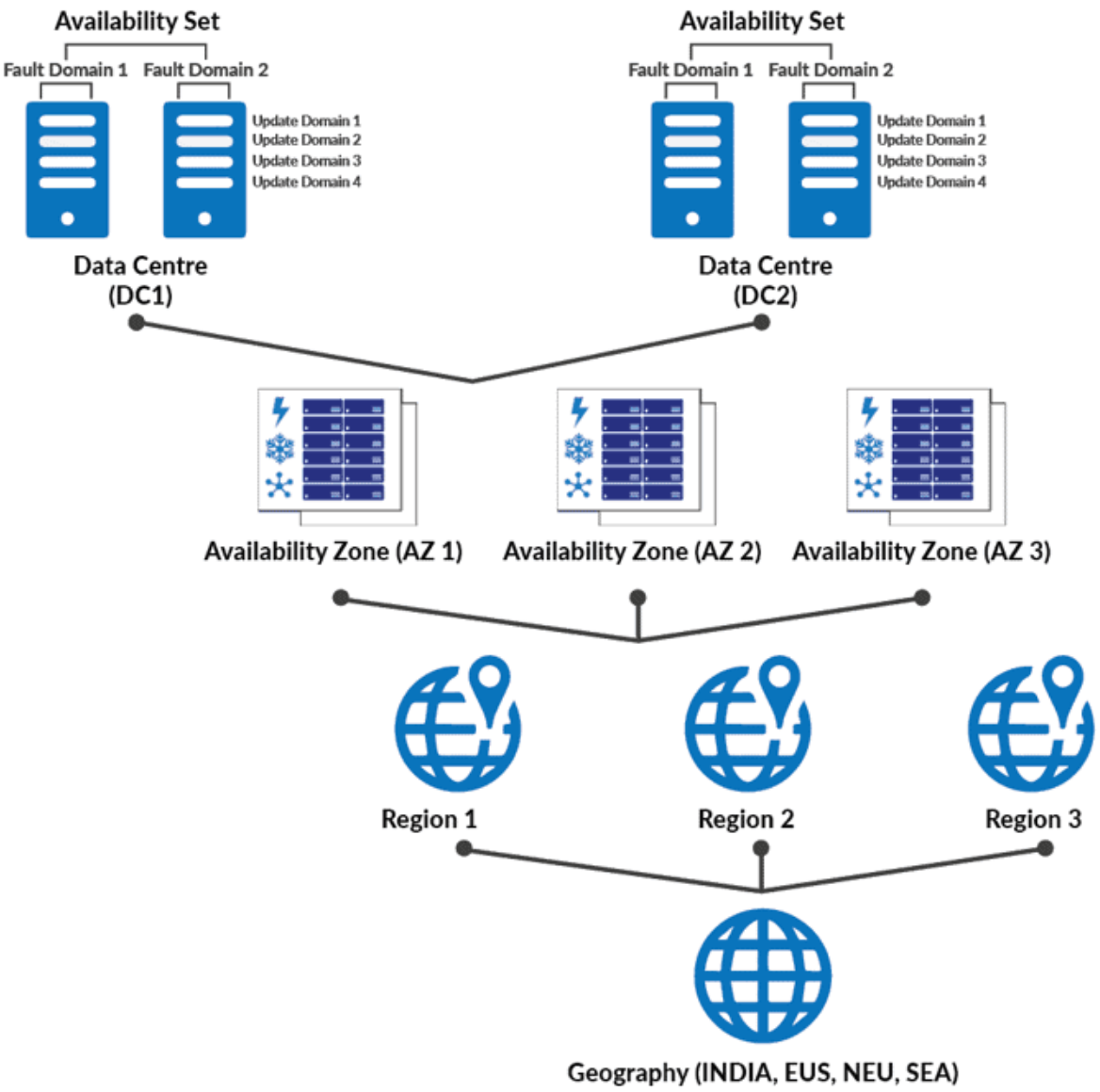
Network Interface Card (NIC)

A Network Interface (NIC) is an **interconnection** between a Virtual Machine and the underlying software network. An Azure VM has one or more network interface cards (NICs) attached to it. Network Interface Card (NIC) is **assigned** with IP address and associated with NSG rules, which is **used** for the communication between virtual machines or internal network or internet.



High Availability options for Azure Virtual Machines

An **Availability Zone** is a high-availability offering that protects your applications and data from data center failures. Availability Zones are unique physical locations within an Azure region.
An **availability set** is a logical grouping of VMs that allows Azure to understand how your application is built to provide for redundancy and availability.



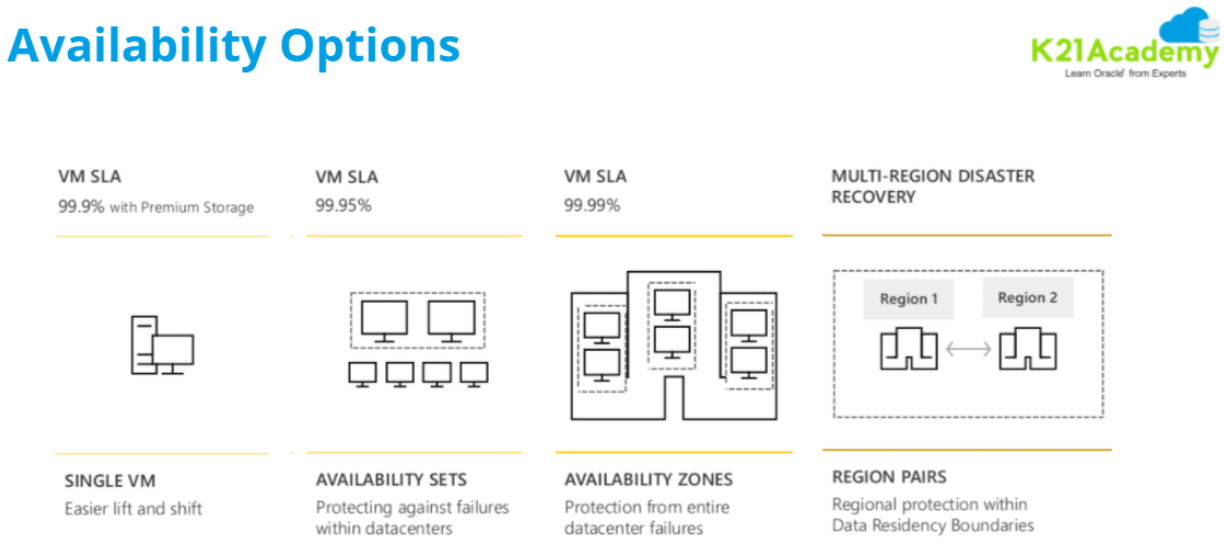
Q1: How many VM we can put in one Resource group?
Ans: Each resource group can hold up to **240 VMs.**
Q2: Can multiple people use the same VM?
Ans: You can have multiple users access the same VM, just one at a time.
Q3: How many NICs can we attach with a VM?
Ans: Virtual machines (VMs) in Azure can have multiple virtual **network interface cards (NICs)** attached to them. A common scenario is to have different subnets for front-end and back-end connectivity. You can associate multiple NICs on a VM to multiple subnets, but those subnets must all reside in the same virtual network (vNet).
Q4. Can we add an existing VM to an availability set?
Ans. **No.** If you want your VM to be part of an availability set, you need to create the VM within the set. There currently isn't a way to **add** a VM to an availability set after it has been created.
Q5. Can we add a NIC to my VM after it's created?
Ans. Yes, this is now possible. The VM first needs to be stopped or deallocated.

Service Level Agreement (SLA)

Service-level agreements (SLAs) describe Microsoft's commitments for uptime and connectivity.

SLA for Virtual Machines

- For all Virtual Machines that have two or more instances deployed across two or more **Availability Zones** in the same **Azure region,** Microsoft's guarantee you will have Virtual Machine Connectivity to at least one instance at least **99.99%** of the time.
- For all Virtual Machines that have two or more instances deployed in the same **Availability Set** or in the same **Dedicated Host Group,** we guarantee you will have Virtual Machine Connectivity to at least one instance at least **99.95%** of the time.



Q6. What happens if Microsoft doesn't meet its SLA?

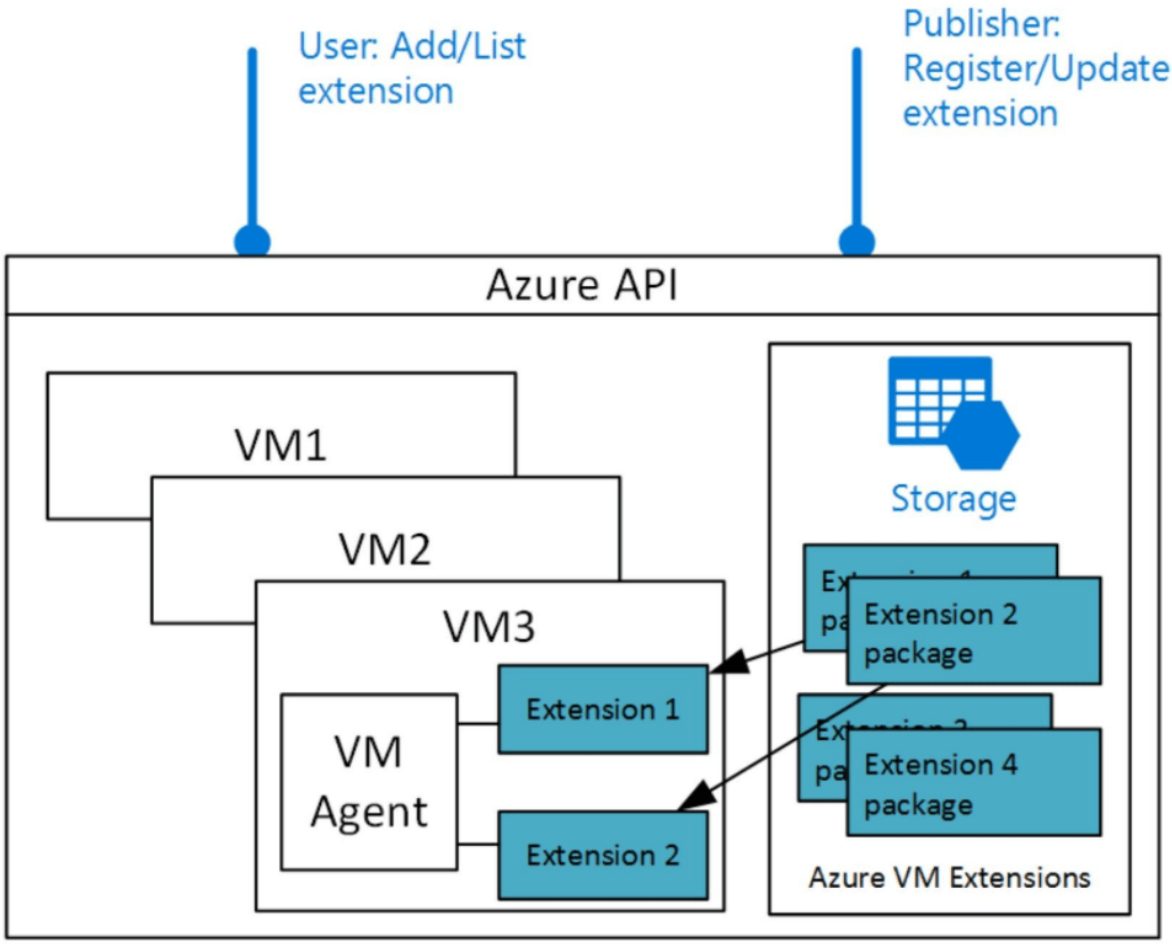
Ans. It is up to the customer or partner to determine if the Microsoft Azure service level agreement has not been met. In order to be **eligible** to submit a claim with respect to any incident, the customer must first have **notified** Customer Support of the incident within 5 business days following the incident.

The customer must also provide sufficient evidence to support the claim. Once the claim has been validated by Microsoft a credit of **10%** will be awarded for SLA's between **99.5%** and **99%.** For SLAs below **99%,** a **25%** credit will be issued for that particular month in which the SLA was not met.

Virtual Machine (VM) Extensions

Azure virtual machine (VM) **extensions** are small applications that **provide** post-deployment configuration and automation tasks on Azure VMs. The Azure platform hosts many extensions covering VM **configuration, monitoring, security,** and **utility applications.** Publishers take an application, wrap it into an extension, and simplify the installation.

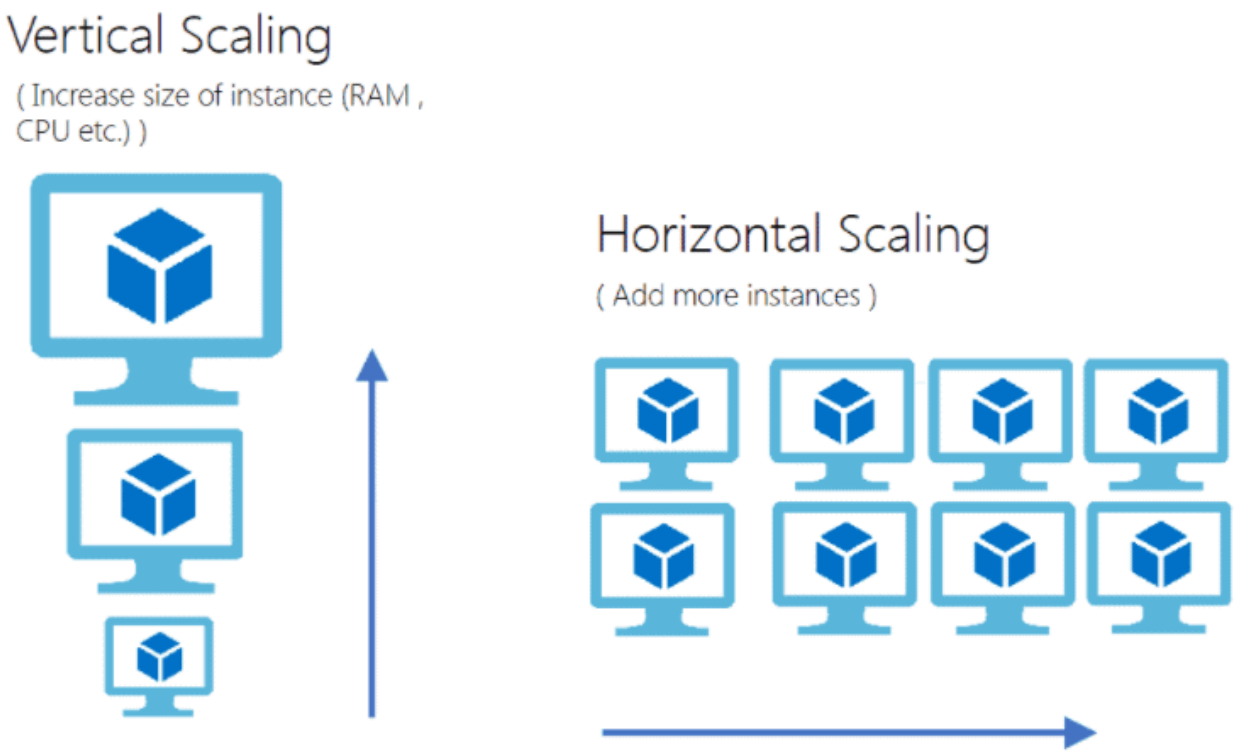
For example, if a virtual machine requires software installation, anti-virus protection, or to run a script inside of it, a VM extension can be used.



Q7. How can we install an extension?
Ans. Azure VM extensions can be **managed** using the Azure CLI, PowerShell, Resource Manager templates, and the Azure portal. To **try** an extension, go to the Azure portal, select the Custom Script Extension, then pass in a command or script to run the extension.
Read more on Windows Custom Script Extension and Linux Custom Script Extension.
Q8. How can I find what extensions are available?
Ans. You can view available extensions by selecting a VM, then selecting **Extensions** in the left menu.
To pull a full list of extensions, see Discovering VM Extensions for Linux and Discovering VM Extensions for Windows.

Virtual Machines Scale Sets

Azure virtual machine scale sets let you create and manage a **group** of load-balanced VMs. The number of VM instances can **automatically** increase or decrease in response to demand or a defined schedule.
Scale sets **provide** high availability to your applications and allow you to centrally manage, configure, and update a large number of VMs. With virtual machine scale sets, you can **build** large-scale services for areas such as compute, big data, and container workloads.

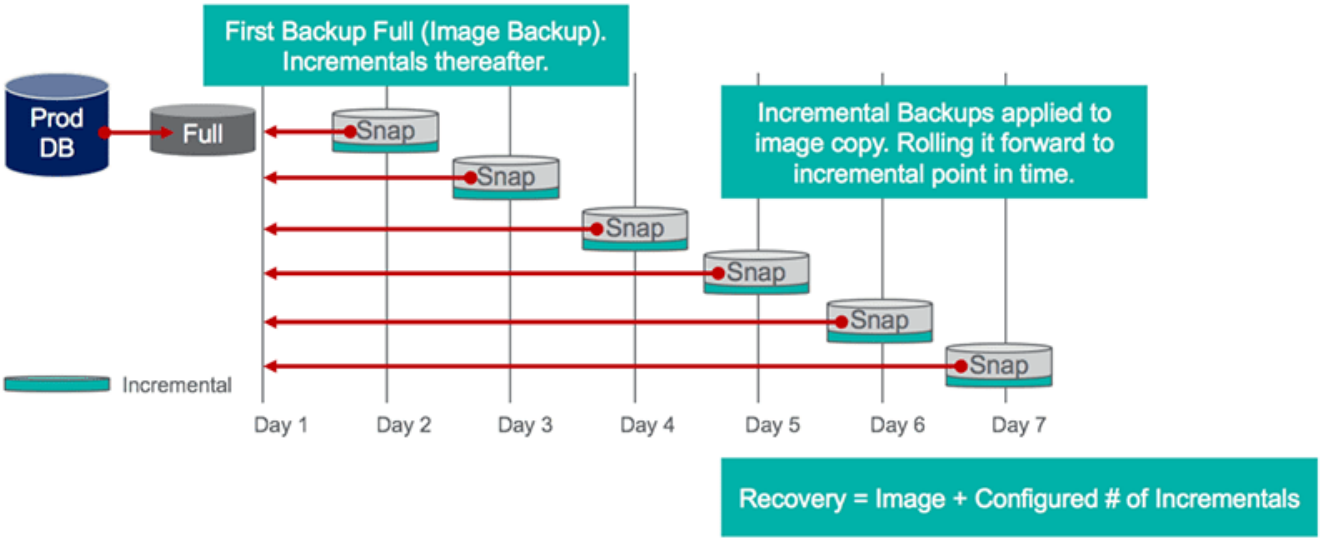


Q9. How many VMs can I have in a scale set?
Ans. A scale set can have 0 to 1,000 VMs based on **platform** images, or 0 to 600 VMs based on **custom** images.
Q10. Can we create a scale set in an existing resource group and move a scale set to another resource group?
Ans. **Yes,** you can **create** a scale set in an existing resource group, and also you can **move** scale set resources to a new subscription or resource group.
Q11. Which Azure regions support scale sets?
Ans. All Azure regions support scale sets. To **protect** your virtual machine scale sets from data centre-level failures, you can **create** a scale set across Availability Zones. Azure regions that support Availability Zones have a minimum of **three** separate zones, each with its own independent **power source, network,** and **cooling.**

Azure Snapshot

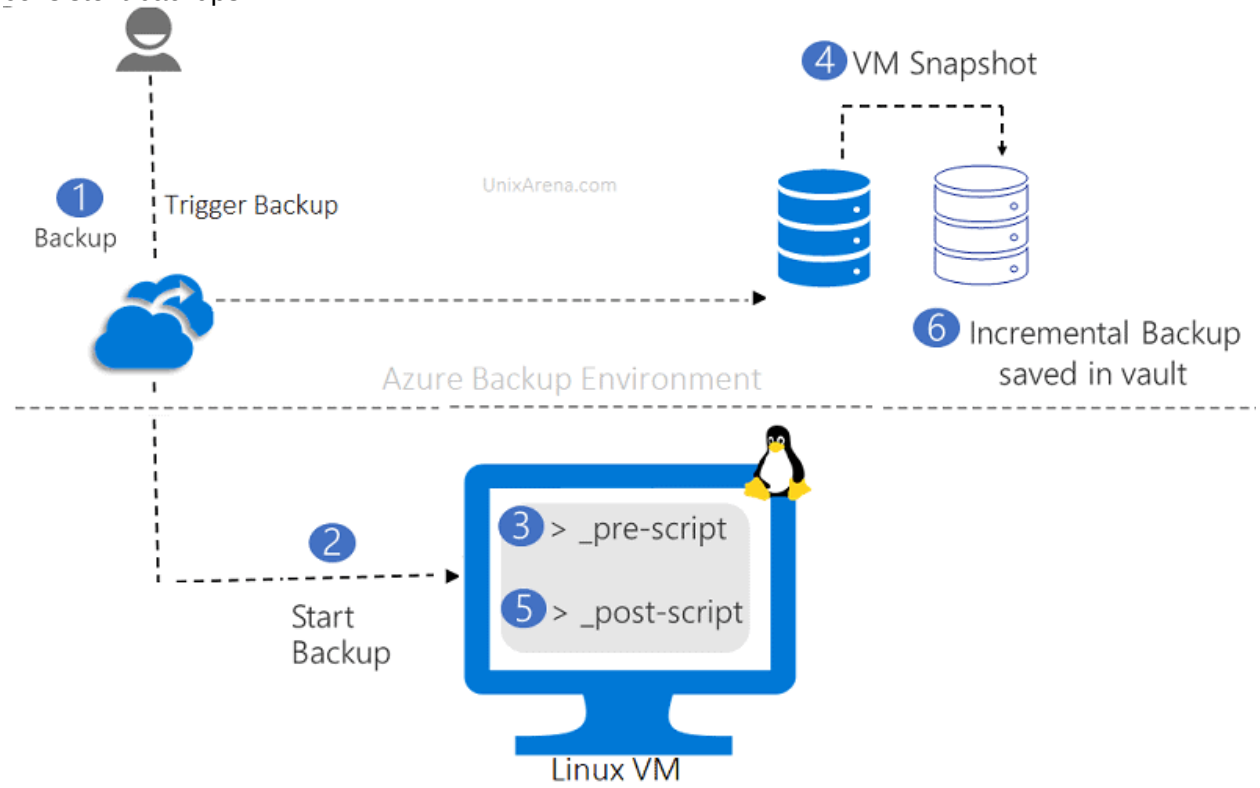
An Azure Snapshot is a **read-only copy** of the existing disk in the Microsoft Azure Cloud. We can create a snapshot of the OS or Data disk. This snapshot can be used as a backup. The snapshot can also be **used** to create a Virtual Machine.
To create a Virtual Machine using a snapshot, it is **better** to shut down the VM before taking its snapshot.
We can create a full snapshot or an incremental snapshot.

- **Full Snapshot:** It makes a **complete** read-only copy of the selected disk.
- **Incremental Snapshot:** It saves on storage costs by making a **partial** copy based on the difference between the last snapshot. This does not make the complete copy of the existing disk each time.



Windows VM vs Linux VM

Windows has the **Volume Snapshot Service (VSS)** framework to ensure application consistent VM backup, but there is no such generic framework for Linux. To ensure your Linux VMs are application-consistent, you can use the Linux **pre-script** and **post-script** framework to take application-consistent backups.



Q12. How many snapshots can a VM have?

Ans. If the base disks are deleted, the snapshot files are not sufficient to restore a virtual machine. A maximum of **32 snapshots** is supported in a chain. However, for better performance use only 2 to 3 snapshots. Do not use a single snapshot for more than **72 hours.**

Q13. What is the VM snapshot size in azure?
Ans. The **first** incremental snapshot is billed only for the used size of 100 GB. 20 GB of data is added to the disk before you created the second snapshot. Now, the **second** incremental snapshot is billed for only 20 GB.
Q14. What disk types support snapshots?
Ans. Premium SSD, standard SSD, and standard HDD support snapshots. For these **three** disk types, snapshots are supported for all disk sizes (including disks up to 32 TB in size). **Ultra** disks do not support snapshots.