Introduction to Virtual Machine

- Azure Virtual Machines (VM) is one of several types of on-demand, scalable computing resources that Azure offers. Typically, you choose a VM when you need more control over the computing environment than the other choices offer. This article gives you information about what you should consider before you create a VM, how you create it, and how you manage it.
- 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.
- Link : https://docs.microsoft.com/en-us/azure/virtual-machines/windows/overview

Uses of Azure VM

- Azure virtual machines can be used in various ways. Some examples are:
- **Development and test** – Azure VMs offer a quick and easy way to create a computer with specific configurations required to code and test an application.
- **Applications in the cloud** – Because demand for your application can fluctuate, it might make economic sense to run it on a VM in Azure. You pay for extra VMs when you need them and shut them down when you don't.
- **Extended datacenter** – Virtual machines in an Azure virtual network can easily be connected to your organization's network.
- The number of VMs that your application uses can scale up and out to whatever is required to meet your needs.

Design Consideration for VM

There are always a multitude of design considerations when you build out an application infrastructure in Azure. These aspects of a VM are important to think about before you start:

- ❑ The names of your application resources
- ❑ The location where the resources are stored
- ❑ The size of the VM
- ❑ The maximum number of VMs that can be created
- ❑ The operating system that the VM runs
- ❑ The configuration of the VM after it starts
- ❑ The related resources that the VM needs

- **Locations :**

❑ All resources created in Azure are distributed across multiple geographical regions around the world. Usually, the region is called **location** when you create a VM. For a VM, the location specifies where the virtual hard disks are stored.

❑ This table shows some of the ways you can get a list of available locations.

Method	Description
Azure portal	Select a location from the list when you create a VM.
Azure PowerShell	Use the Get-AzLocation command.
REST API	Use the List locations operation.
Azure CLI	Use the az account list-locations operation.

- **Availability :**

❑ Azure announced an industry leading single instance virtual machine Service Level Agreement of 99.9% provided you deploy the VM with premium storage for all disks. In order for your deployment to qualify for the standard 99.95% VM Service Level Agreement, you still need to deploy two or more VMs running your workload inside of an availability set. An availability set ensures that your VMs are distributed across multiple fault domains in the Azure data centers as well as deployed onto hosts with different maintenance windows. The full Azure SLA explains the guaranteed availability of Azure as a whole.

- **VM size :**

❑ The size of the VM that you use is determined by the workload that you want to run. The size that you choose then determines factors such as processing power, memory, and storage capacity. Azure offers a wide variety of sizes to support many types of uses.

❑ Azure charges an hourly price based on the VM's size and operating system. For partial hours, Azure charges only for the minutes used. Storage is priced and charged separately.

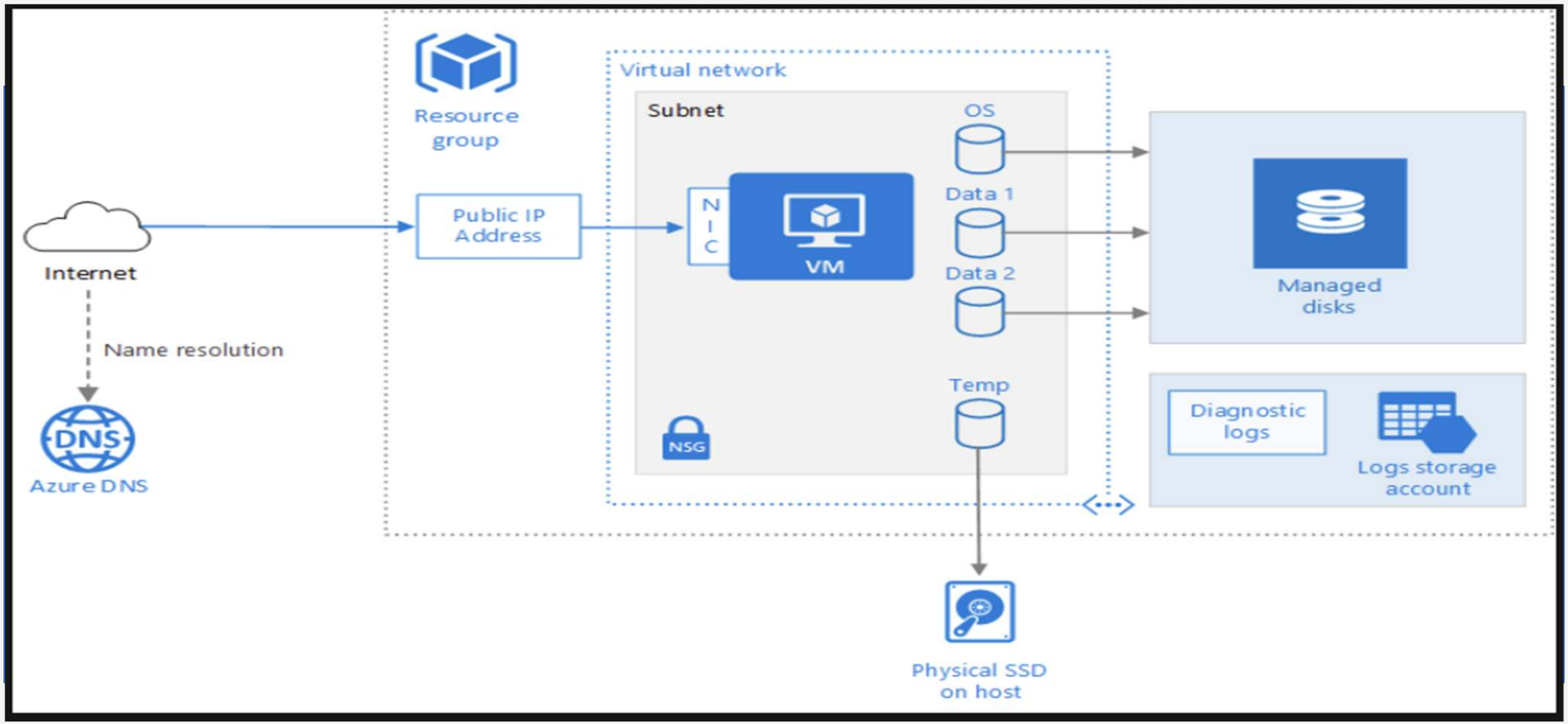
Link : https://docs.microsoft.com/en-us/azure/virtual-machines/sizes

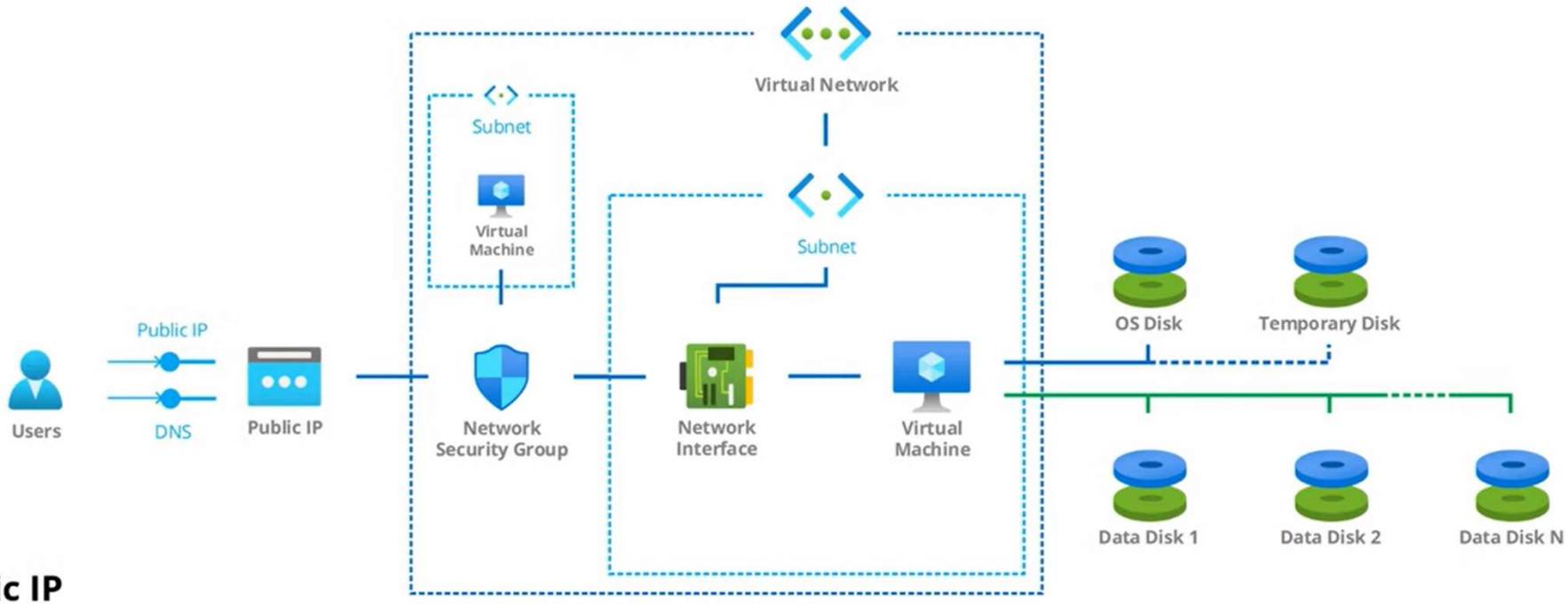
- **Sizes for virtual machines in Azure :**
- Link : https://www.youtube.com/watch?v=zOSvnJFd3ZM

Type	Sizes	Description
General purpose	B, Dsv3, Dv3, Dasv4, Dav4, DSv2, Dv2, Av2, DC, DCv2, 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, Ev4, Esv4, Edv4, Edsv4, Ev5, Esv5, Edv5, Edsv5, Easv5, Eadsv5, 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	High disk throughput and IO ideal for Big Data, SQL, NoSQL databases, data warehousing and large transactional databases.
GPU	NC, NCv2, NCv3,	Specialized virtual machines targeted for heavy

Run a Windows VM on Azure and Design Consideration

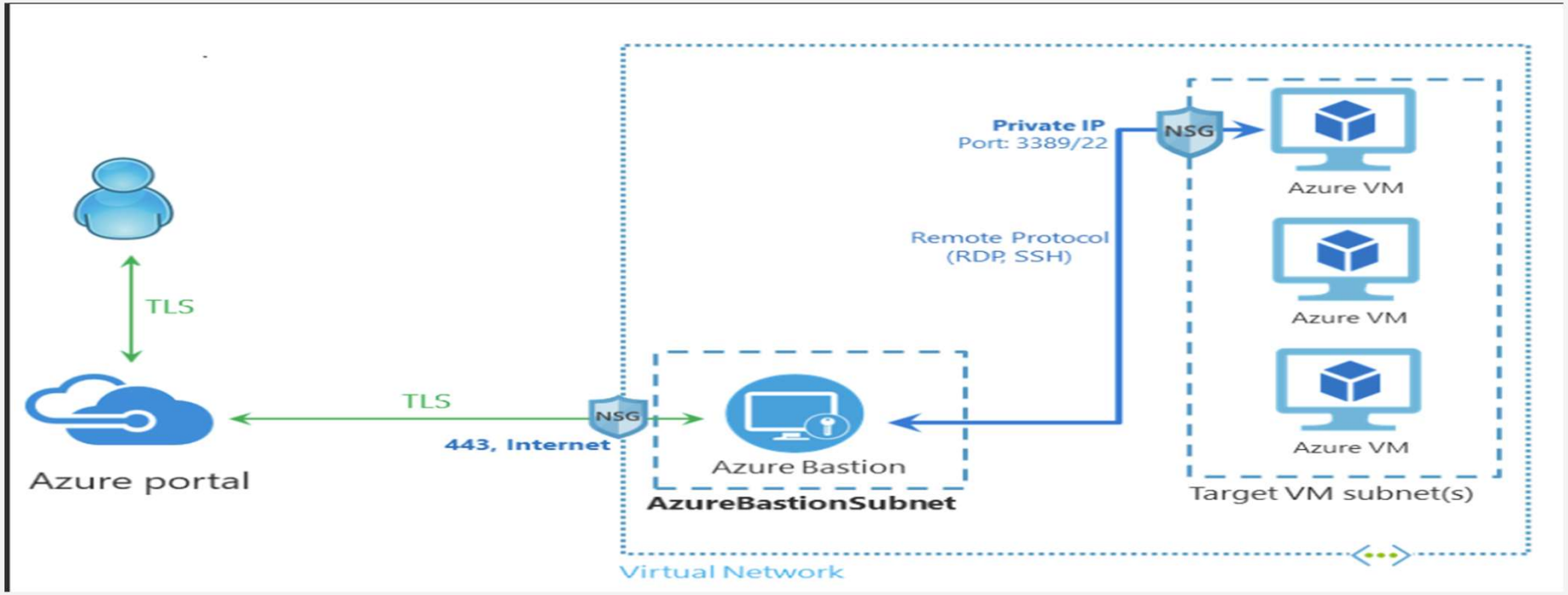
Link : https://docs.microsoft.com/en-us/azure/architecture/reference-architectures/n-tier/windows-vm





Public IP

- Permanently assigned **static IP address**
- Allows for **FQDN configuration** for <name>.<region>.cloudapp.azure.com


Private IP
Port: 3389/22
NSG
Azure VM
Azure VM
Azure VM
Remote Protocol
(RDP, SSH)
TLS
TLS
NSG
443, Internet
Azure Bastion
AzureBastionSubnet
Azure portal
Target VM subnet(s)
Virtual Network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Creating a VM using Azure Portal and additional Link

- Link : https://docs.microsoft.com/en-us/azure/virtual-machines/windows/quick-create-portal
- Link : https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-manage-vm
- Azure VM Scale Set --Link : https://docs.microsoft.com/en-us/azure/virtual-machine-scale-sets/overview
- Azure VM Availability Set --Link : https://docs.microsoft.com/en-us/azure/virtual-machines/availability-set-overview

- VM Pricing Calculator : https://azure.microsoft.com/en-us/pricing/details/virtual-machines/linux/


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- Link : https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-manage-vm