

Azure with Terraform

What is Azure Cloud?

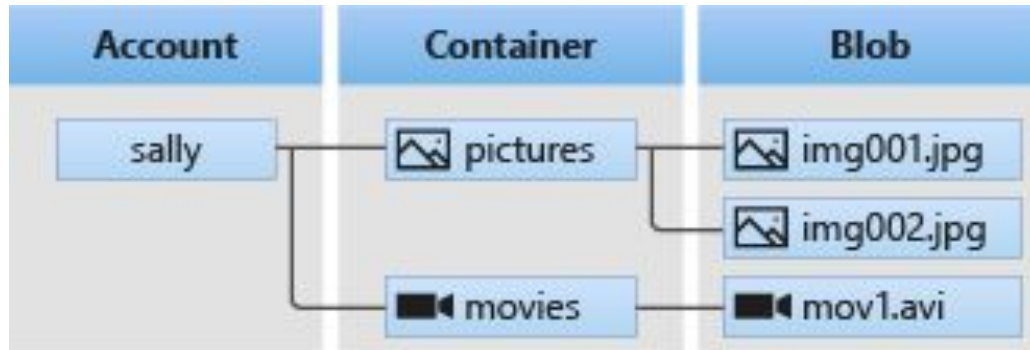
- **Azure** is a comprehensive cloud computing platform offered by Microsoft.
- It provides a vast collection of services, including computing power, storage, databases, networking, analytics, and more, all accessible over the internet.
- Instead of buying and maintaining physical hardware, you can rent these services on a pay-as-you-go basis.
- Azure is used by millions of businesses worldwide to build, deploy, and manage applications, and to store data.
- It provides the foundational building blocks for everything from simple websites to complex, enterprise-grade applications.

What is Terraform?

- **Terraform** is an open-source tool for building, changing, and versioning infrastructure safely and efficiently.
- It is an **Infrastructure as Code (IaC)** tool, which means you write code to define the infrastructure you want, and Terraform takes care of provisioning and managing those resources for you.
- Instead of manually clicking through a cloud provider's console to create resources, you write configuration files that describe your desired state.
- Terraform then figures out the right sequence of actions to achieve that state.
- This makes your infrastructure repeatable, transparent, and easy to manage with version control systems like Git.

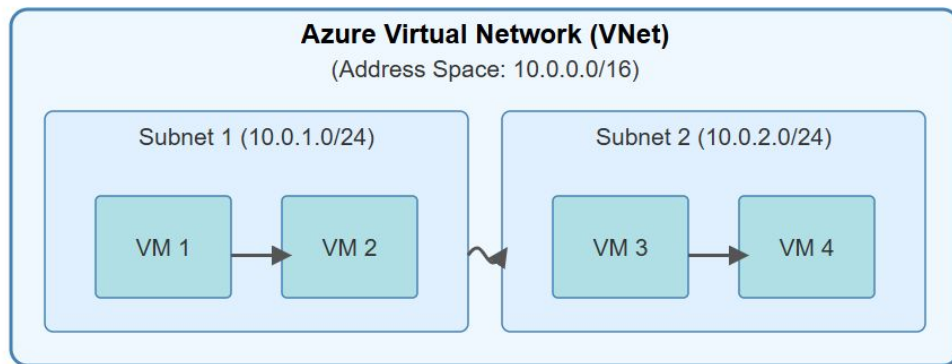
Azure Blob Storage

- **Azure Blob Storage** is Microsoft's object storage solution for the cloud. It's designed to store vast amounts of unstructured data, like text or binary files.
- This could include images, videos, documents, data lake files, and log data. Blob storage is highly scalable, durable, and can be accessed from anywhere in the world via HTTP or HTTPS.
- This diagram illustrates how a **Storage Account** contains multiple **Containers**, and each container holds various **Blobs** (files).



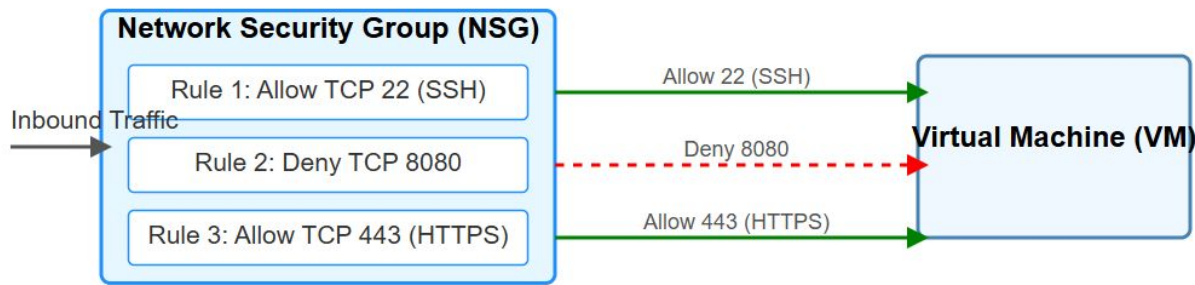
Azure Virtual Network (VNet)

- An **Azure Virtual Network** is the fundamental building block for your private network in Azure.
- It enables various Azure resources, like Virtual Machines (VMs), to securely communicate with each other, the internet, and your on-premises networks.
- A VNet is a logically isolated section of the Azure cloud, and you have complete control over its IP address ranges, subnets, and routing.
- This diagram shows a **Virtual Network** containing multiple **Subnets**, and how resources like Virtual Machines are placed within those subnets.



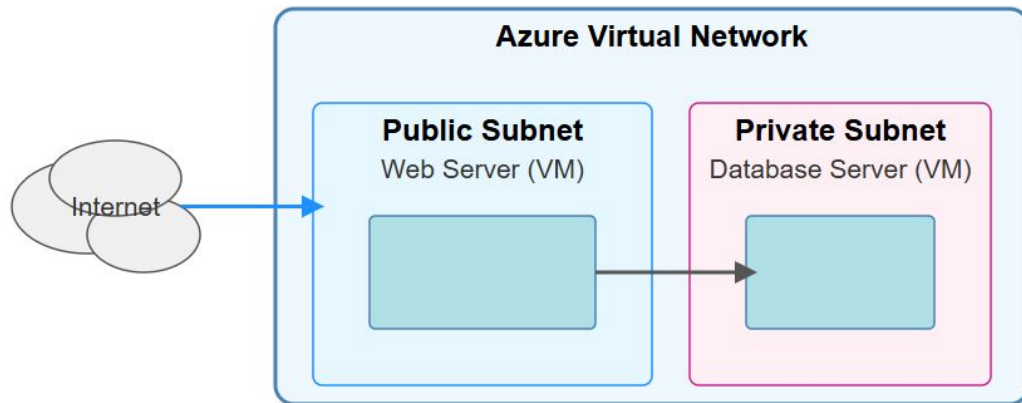
Azure Network Security Group (NSG)

- An **Azure Network Security Group (NSG)** acts as a virtual firewall for your Azure resources.
- It contains a list of security rules that control inbound and outbound network traffic to resources like VMs or subnets.
- Each rule specifies the source and destination, port, protocol, and whether to allow or deny the traffic.
- NSGs are a crucial part of securing your network by allowing you to filter traffic at a granular level.
- This diagram shows how an **NSG** with its rules acts as a filter for inbound traffic before it can reach a **Virtual Machine**.



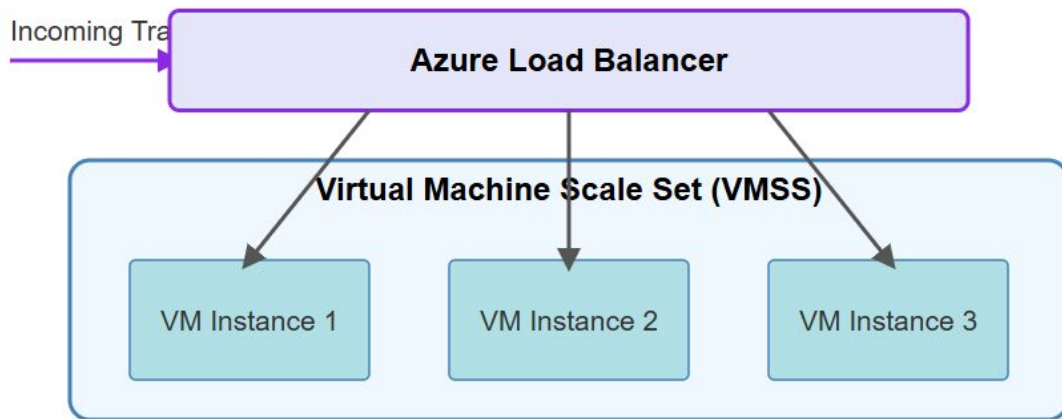
Private and Public Subnets

- Within an Azure VNet, you can create different **subnets** to segment your network.
- The distinction between a private and public subnet lies in its connectivity to the internet. A **public subnet** is one where resources (like a web server) can have a public IP address and communicate directly with the internet.
- A **private subnet**, on the other hand, is isolated and its resources (like a database server) do not have direct inbound access from the internet.
- This diagram illustrates how resources in a public subnet are directly exposed to the Internet, while resources in a private subnet are not, but can still communicate internally.



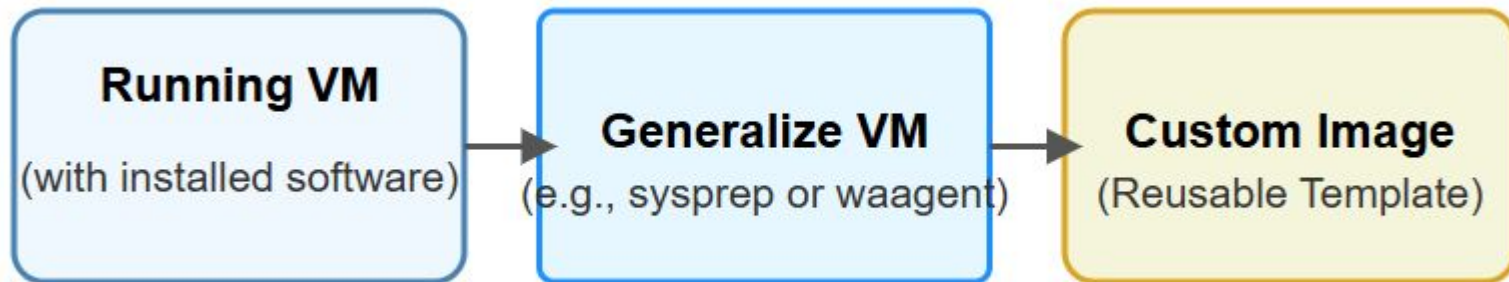
Virtual Machine Scale Set (VMSS)

- A **Virtual Machine Scale Set** is an Azure compute resource that allows you to deploy and manage a group of identical, load-balanced virtual machines.
- With a VMSS, you can easily create and manage a large number of VMs and automatically scale the number of instances in the set based on performance metrics (like CPU usage).
- This is a key component for building highly available and scalable applications.
- This diagram shows a **Load Balancer** distributing incoming traffic across multiple identical **Virtual Machines** within a **Scale Set**.



Azure Custom VM Image Creation

- **Azure Custom VM Image Creation** is the process of creating a reusable template from a virtual machine.
- Instead of starting from a generic marketplace image (like Ubuntu or Windows Server), you can build a VM, install and configure all your necessary applications and settings, and then capture that VM as a custom image.
- This image can then be used to deploy new VMs that are instantly ready to go, ensuring consistency and saving time.
- This diagram outlines the process: a running VM is first generalized, and then a custom image is created from its disk.



Azure Standard Load Balancer

- An **Azure Standard Load Balancer** is a high-performance, low-latency Layer 4 (TCP, UDP) load balancer that distributes incoming traffic among healthy virtual machines in a backend pool.
- It provides high availability for your applications by ensuring traffic is sent only to the VMs that are healthy and available.
- The standard load balancer also offers more advanced features like health probes, outbound connectivity to the internet, and support for high-throughput scenarios.
- This diagram shows how a **Load Balancer** distributes incoming traffic to healthy VMs and uses a **Health Probe** to determine which VMs are available.

