**What is Azure Virtual Network?**

* Azure Virtual Network is like creating your own private space in the Azure cloud, allowing you to organize, secure, and connect your resources as needed.
* Your computer things can talk to the internet by default. If you want better control, use special tools public IP address, NAT gateway, or public load balancer. If you want others to send things to your computers, give them a clear address.
* **Azure resources communicate** securely with each other in one of the following ways:
  + **Virtual network**: You can deploy VMs and other types of Azure resources in a virtual network.
  + **Virtual network service endpoint**: You can extend your virtual network's private address space and the identity of your virtual network to Azure service resources over a direct connection.
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* **Communicate with on-premises resources**: You can connect your on-premises computers and networks to a virtual network by using any of the following options:
  + Point-to-site virtual private network (VPN): Established between a virtual network and a single computer in your network.
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  + **Azure ExpressRoute:** Established between your network and Azure, through an ExpressRoute partner. This connection is private. Traffic doesn't go over the internet.
* **Filter network traffic**: You can filter network traffic between subnets by using either or both of the following options:
  + **Network security groups**: Network security groups and application security groups can contain multiple inbound and outbound security rules.
  + **Network virtual appliances**: A network virtual appliance is a VM that performs a network function, such as a firewall or WAN optimization.

**Terraform:**

* Initialize the Variable with variable.tf

**variable "resource\_group\_name" {**

**default = "myTFResourceGroup"**

**}**

Here we initialized variable with keyword variable and name is resource\_group\_name and in case If we don’t give any name to resource in the prompt it take the default name as myTFResourceGroup

* Create a main.tf file

**resource "azurerm\_resource\_group" "rg" {**

**name = var.resource\_group\_name**

**location = "westus2"**

**tags = {**

**Environment = "Terraform Getting Started"**

**Team = "DevOps"**

**}**

resource: This keyword indicates the declaration of a resource in Terraform."azurerm\_resource\_group": This is the resource type, specifically for creating an Azure Resource Group.

* During the terraform apply command inorder to give the specific name we have to enter the command as **terraform apply -var "resource\_group\_name=Anudeep\_RG”**
* **Customize Terraform configuration with variables**
  + Terraform input variables are like allowing someone to customize your infrastructure setup without causing chaos. It's a way to make your Terraform projects flexible and user-friendly.
* **NAT GATEWAY:** You can use Azure NAT Gateway to let all instances in a private subnet connect outbound to the internet while remaining fully private.
  + NAT Gateway is like a security guard that follows the rule of not trusting anything by default. With it, your private computers don't need to show their names to the internet. Instead, they can talk to the internet through a special address provided by the security guard (NAT Gateway). It's a bit like giving each computer a mask when they go online.
  + Azure NAT Gateway is like a traffic controller for your private network. It helps your computers talk to the internet smoothly and decides the best way for them to go out.
  + **Azure Bastion** acts as a secure bridge between your local machine and the virtual machines in Azure, eliminating the need for public IP addresses and providing a secure way to connect directly from the Azure portal.
* **Virtual Network (VNet) service endpoint** provides secure and direct connectivity to Azure services over an optimized route over the Azure backbone network. Endpoints allow you to secure your critical Azure service resources to only your virtual networks. Service Endpoints enables private IP addresses in the VNet to reach the endpoint of an Azure service without needing a public IP address on the VNet.

