# Azure Networking

**Classless Inter-Domain Routing**

CIDR is a method for allocating and managing IP addresses efficiently.

CIDR Notation

IP address / Subnet mask

192.168.1.10/24

**Subnet Mask**

The process of dividing a network into smaller network sections is called **subnetting**.

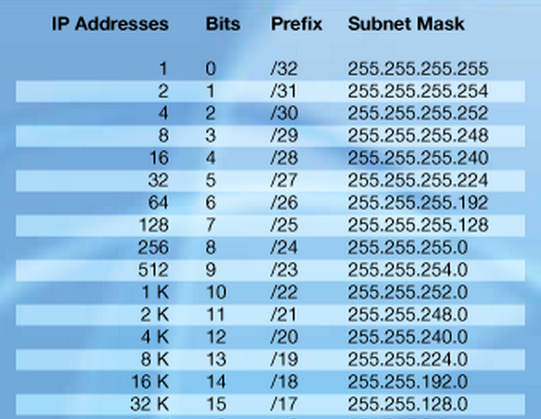
Each address space is divided into a network portion and a host portion.

A subnet mask determines which part of an IP address is network and which part is host.

**CIDR /24 means the first 24 bits are for the network, and the last 8 bits are for hosts.**

**For the address 192.168.0.15, the 192.168.0 portion describes the network and the 15 describes the host.**

**Number of IP Addresses = 2 ^(Number of Host Bits)**



**Public and Private IP**

Public networks like the Internet communicate by using public IP addresses.

Private networks like your Azure Virtual Network use private IP addresses, which aren't routable on public networks

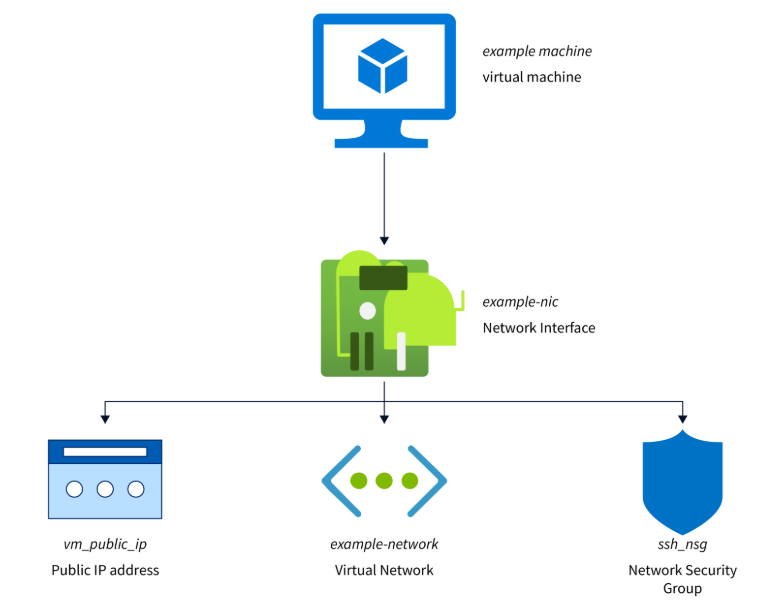
**Dynamic and Static**

Dynamic - An assigned address that can change over the lifespan of the Azure resource

Static - An assigned address that doesn't change over the lifespan of the Azure resource

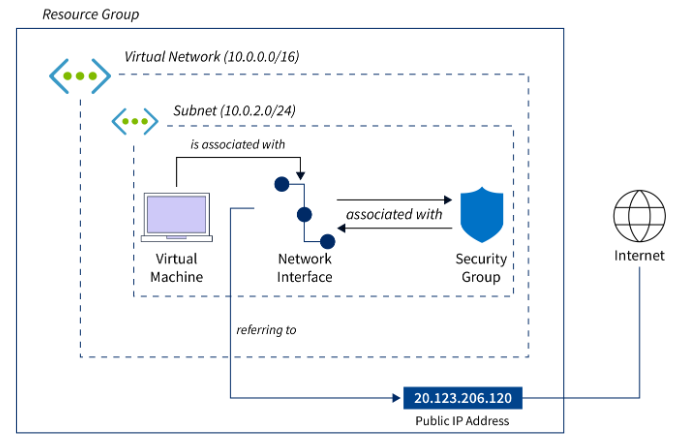
**Networking Components**

* Network Interface
* Network Security Group
* IP Address
* DNS Servers



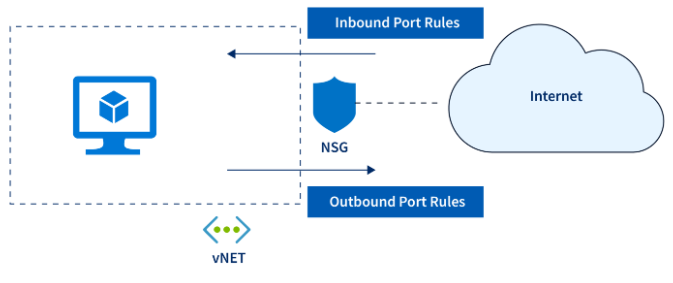
Network Interface (NIC)

* Connects a VM to a VNet.
* A gateway that allows a VM to communicate with other resources in a network.
* Manages the flow of data to and from a VM
* Each Network Interface is assigned one or more IP configurations which include ***private IP addresses, associated public IP addresses (if required), and network security group (NSG) settings.***



Network Security Group (NSG)

Acts as virtual firewalls, controlling inbound and outbound traffic to a Network Interface.



* Define inbound and outbound traffic rules.
* Filter traffic based on the source, destination, and protocol.
* Work with route tables to ensure that traffic is directed as intended.

Domain Name System (DNS) Servers

* Essential for translating human-readable domain names into IP addresses.
* Configuring DNS servers for a Network Interface ensures that it can seamlessly communicate with resources both within and outside the Azure environment.

**AzCLI**

**Create virtual network**

*az network vnet create --resource-group myRGNetwork --name myVNet --address-prefix 10.0.0.0/16 --subnet-name myFrontendSubnet --subnet-prefix 10.0.1.0/24*

**Create sub network**

*az network vnet subnet create --resource-group myRGNetwork --vnet-name myVNet --name myBackendSubnet --address-prefix 10.0.2.0/24*

**Create NSG**

*az network nsg create --resource-group myRGNetwork --name myBackendNSG*