Virtual Network (VNet) : a virtual network enables many types of azure resources, such as azure virtual machines or VMs to securely communicate with each other, the internet and on-premises networks.

why we are seperating networks (Subnett) ????

it makes easier to keep track of which resources go together. --> resource groups

address allocation is more efficient --> Address allocation

you can use individual subnets using a network security --> subnet security

* a Vnet belongs to single region. every resource on the vnet must be in the same region
* a Vnet belongs to just one subscription but a subscription can have multiple Vnets.

VNet Peering : this feature lets you connect 2 or more virtual networks in azure. traffic between virtual machines in a peered network uses the private microsoft backbone network and never passes through the public internet.

benefits :-

. Low latency , high bandwidth

. Link seperate networks - Resources in seperate virtual networks can communicate with each other

. Data transfer - transfer data easily between subscription and deployment models in seperate regions.

* a Virtual Network is a fundamental part of azure and connects all your resources and services.
* An address space is the range of IP address available to assign to resources.
* A subnet is a smaller network, which is part of your VNet.use these for security and logical division of resources.subnets can also be secured individually.
* A VNet is in a single region and single subscription
* VNet in the cloud can scale, have high availability and isolation.

Example : -

the VM that you use for processing some of the old data is getting overloaded at times , you added a second VM but how would you manage the traffic flow and use both ???????

Adding a Load Balancer in front of the VMs to capture the traffic before it reaches them means you can manage where the traffic goes.

Load Balancer distributes new inbound flows that arrive on the load Balancer's frontend to backend pool instances, according to rules and health probes.

inbound flows --> traffic from the internet or local Vnet

Any inboud traffic will be received by the load balancer.

Fontend --> the access point for the load balancer.

VPN Gateway :

when you want to securely communicate with azure resources and your on-premises network,what do you do ?????

Virtual network gateway is composed of two or more virtual machines that are deployed to a specific subnet you create which is called the gateway subnet.

the vms that are located in the gateway subnet are created when you create a virual network gateway.

VPN gateway is a specific type of virtual network gateway that is used to send encrypted traffic between an azure virtual network and an on-premises location over the public intenet.

site-to-site connection

Azure VNet --->VPN gateway

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Tunnel

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on-premises

VNET

* a VPN gateway is specific VNet gateway.it consists two or more dedicated VMs.
* VNet gateway + "vpn" becomes VPN gateway
* An VPN gateway sends encrypted data between azure and on premises network
* azure gateway subnet, secure tunnel and on-premises gatewat makes up a VPN gateway scenario.
* An application gateway is the higher level gateway load balancer.
* it works on the http request of the traffic,instead of the IP address and port.
* Traffic from specific web address can go to a specific machine. such as images, videos is a fit for most other azure services
* supports autoscaling,end-to-end encryption, zone redundancy and multi site hosting.

