16th Oct 2023

VPC

VPC Features & Benefits

- You have complete control over your virtual networking environment
    - **selection of your own IP address range**
    - **creation of subnets**
    - **configuration of route tables**
    - **configuration of network gateways.**

- A variety of connectivity options exist for your Amazon VPC. **You can connect your VPC to the Internet, to your data center, or other VPCs**, based on the AWS resources that you want to expose publicly and those that you want to keep private.

- **Layered security**
    - **Instance(Server) level - Security Groups (firewall on instance/server level)**
    - **Subnet level - Network ACLs (firewall on the subnet level) - NACL - Network Access Control List**

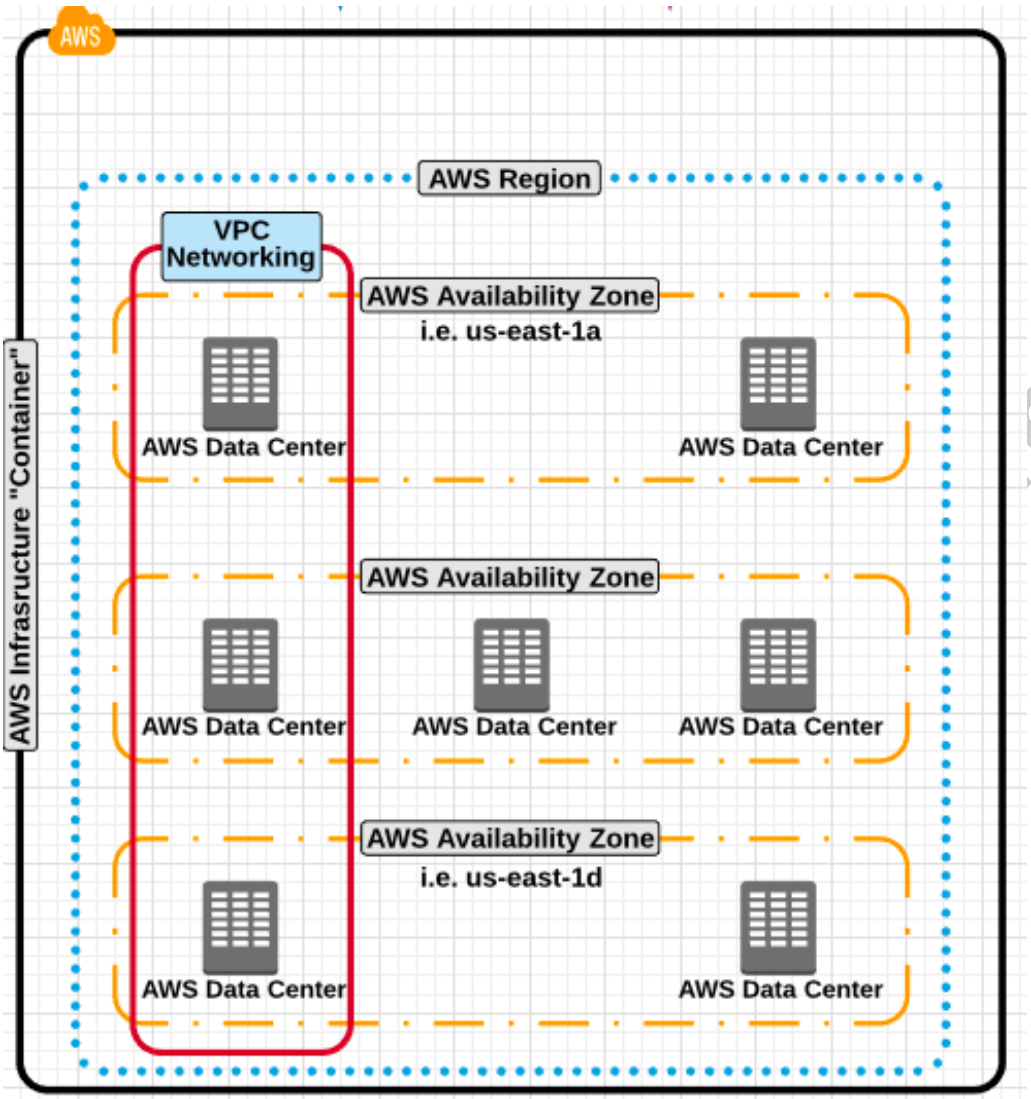
VPC Connectivity Options

- Connect directly to the Internet (**public subnets**) – You can launch instances such as web servers into a publicly accessible subnet where they can send and receive traffic from the Internet.

- Connect to the Internet using (**private subnets**) – Private subnets can be used for instances such as database servers that you do not want to be directly addressable from the Internet.

- Connect privately to other VPCs - **Peer VPCs** together to share resources across multiple virtual networks owned by your or other AWS accounts.

- **NOTE** : First thing you need to understand is, VPC within a region spans across Multiple Availability zones because of that it spans across multiple data centres.


AWS
AWS Region
VPC Networking
AWS Availability Zone
i.e. us-east-1a
AWS Data Center
AWS Data Center
AWS Availability Zone
AWS Data Center
AWS Data Center
AWS Data Center
AWS Availability Zone
i.e. us-east-1d
AWS Data Center
AWS Data Center
AWS Infrasructure "Container"

Default VPC

- Your AWS resources are automatically provisioned in a ready-to-use default VPC that was created for you.
- The default VPC is meant to allow the user easy access to VPC without having to configure it from scratch.
- Default VPC has CIDR, Security Group, NACL and Route Table settings
- Has Internet Gateway created and attached by default
- Each instance(Server) launched in the default VPC (by default) has a private and public IP address (defined on the subnet settings).

VPC Network Routing Basics

- Now to understand Routing we need to first look into VPC Components
    - **Internet Gateway**
    - **Subnets**
    - **Route Tables**
    - **Network Access Control List - NACL**
    - **Security Group**

- "To enable access to or from the internet to an instance in a VPC which resides in a subnet, you must attach an Internet gateway to your VPC, ensure that your subnet route table points to the Internet gateway and ensure that instance has a public IP address, and ensure that your network access control and security group rules allow the relevant traffic to your instance" -- AWS