WIPRO NGA Program – Embedded Testing

Capstone Project Presentation – 26 May and 27 May 2025

Project Title:
Design and Deployment of Custom VPC with Subnets and EC2 Instance on AWS

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Objectives and AWS VPC Overview

Objectives

1. Design a secure and scalable custom Virtual Private Cloud (VPC) in AWS
2. Create public and private subnets with proper segmentation
3. Configure route tables and internet gateway for connectivity
4. Deploy and test EC2 instance in the public subnet

AWS VPC Overview

- Virtual Private Cloud: Logically isolated section of AWS cloud
- Subnets: Public (internet accessible) vs Private (isolated)
- CIDR Blocks: IP address range definition (e.g., 10.0.0.0/24)
- Route Tables: Network traffic routing rules

Architecture Design & Network Components

Network Architecture

- ✓ VPC CIDR Block: 10.0.0.0/24 (256 IP addresses)
- ✓ Public Subnet: 10.0.0.0/25 (128 IPs) internet accessible.
- ✓ Private Subnet: 10.0.0.128/25 (128 IPs) isolated from internet.
- ✓ Internet Gateway: Enables internet communication
- ✓ Route Tables: Public route table with IGW, Private route table isolated

Security Components

- ✓ Security Groups: Instance-level firewall (stateful)
- ✓ Network ACLs: Subnet-level security (stateless)

Implementation

Phase 1: VPC Setup

1. Create custom VPC with CIDR 10.0.0.0/24
2. Create and attach Internet Gateway
3. Create public subnet (10.0.0.0/25) and private subnet (10.0.0.128/25)

Phase 2: Network Configuration

1. Configure route tables - Public route to IGW (0.0.0.0/0)
2. Associate subnets with appropriate route tables
3. Set up security groups for SSH access

EC2 Instance Deployment & Testing

Deployment Process:

1. Launched Red Hat EC2 instance (t2.micro) in public subnet
2. Enabled auto-assign public IP
3. Created RSA key pair for secure SSH access
4. Configured security group for SSH (port 22)

Connectivity Testing:

1. SSH connection established using PuTTY with private key
2. Username: ec2-user
3. Internet connectivity verified through ping google.com
4. Successful validation of network configuration

Conclusion

Project Achievements:

- Successfully created isolated cloud network environment
- Implemented proper subnet segmentation (public/private)
- Established secure internet connectivity for public resources
- Verified functionality through EC2 instance deployment and testing

Outcomes:

- Hands-on experience with AWS networking components
- Understanding of VPC security and routing concepts
- Practical skills in cloud infrastructure deployment
- Foundation for real-world cloud solution architecture

THANK YOU