Problem statement:

USING TERRAFORM:

- VPC 10.161.0.0/24.

- 3 Subnets: 1 per availability zone.

- 3 EC2 instances.

- ALB serving port 80 on each instance.

USING ANSIBLE:

- Deploy and configure an Nginx Docker container on each EC2 instance.

- Each nginx instance must have a different index.html (e.g. Hello, server1; Hello, server2; Hello, server3). Use Jinja2.

Solution by steps (sequence):

1. I created VPC with given IP range and divided it into 3 subnet (one for each Availability zone) as follows.
   - 10.161.0.0/25 - public
   - 10.161.0.128/26 - private
   - 10.161.0.192/26 - private

2. I created NAT gateway for private and Internet gateway for public subnet
3. Created route table and associated with subnets
4. I create role for EC2 to give necessary permission on Cloudwatch logs
5. EC2 profile with this role is created to attach to each EC2 machine.
6. Created Ec2 instance within given subnet, Ec2 profile
7. Created Load balancer serving on port 80 , added target group which includes above 3 Ec2 instance in it

USING ANSIBLE:

1. Create dynamic inventory for Ec2 instance.
2. I wrote ansible role which will do following.
   - Install/configure cloudwatch agent and start it
   - Create/install required dependencies like file/folder creation, software etc.
   - Run nginx container using podman
   - Update index.html for all nginx server as per problem statement

Assumption while doing solution:

1. You have AWS account with secret and access key
2. You have Key pair created for your AWS EC2 instance and EC2 instance using RHEL8

3. Podman utility is used instead of docker as docker is not supported by RHEL8. PODMAN is same as docker.
4. I have created basic automation as this is something I achieve it 2 days. There is scope of variabilization and fine tuning of solution. (I have attempted bit , incomplete which I will attach it in “develop” branch.

Diagram only for understanding solution.

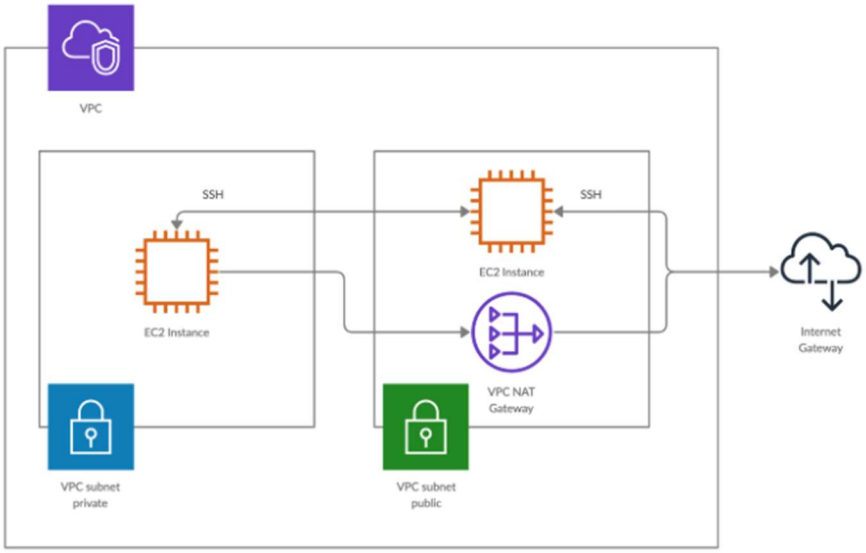

Diagram: 1.0 Reference : [diagram 1.0 - Terraform-automation]

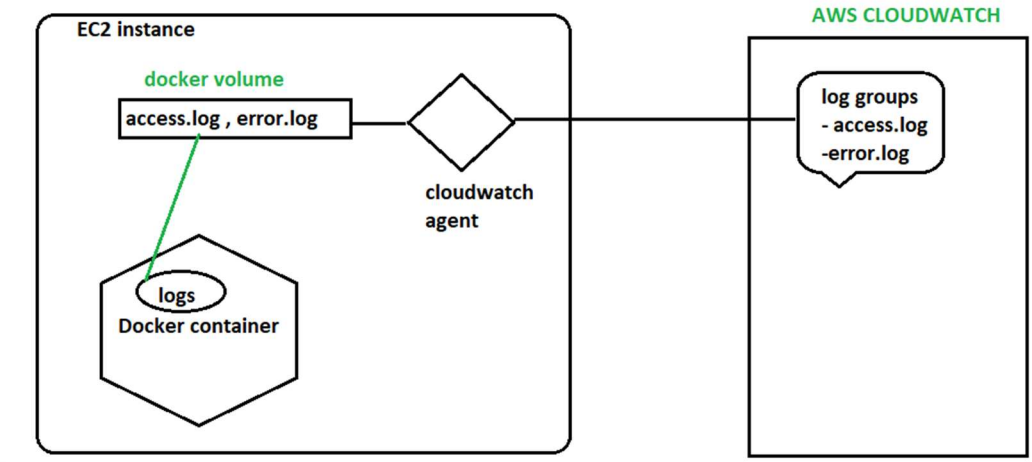

Diagram: 2.0 - Flow of docker container logs to cloudwatch

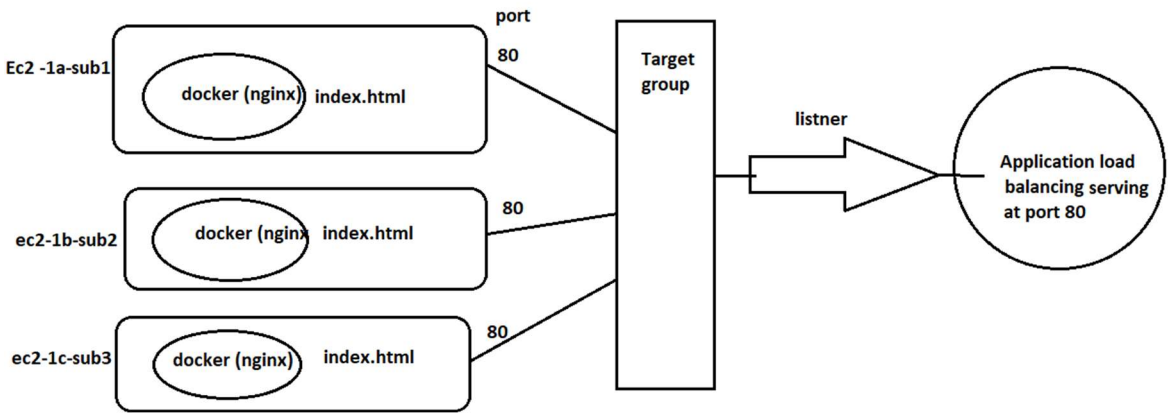

Diagram 3.0 : ALB serving at port 80 representing target group and targets

References:

https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html

https://learn.hashicorp.com/tutorials/terraform/install-cli
https://medium.com/@maneetkum/create-subnet-per-availability-zone-in-aws-through-terraform-ea81d1ec1883
https://www.udemy.com/course/terraformcertified/learn/lecture/23448668#overview

https://www.youtube.com/watch?v=1Ta1PMgMie0
https://www.youtube.com/watch?v=enNnT5Tcim4
https://registry.terraform.io/providers/hashicorp/aws/3.74.0
https://www.youtube.com/watch?v=IRQhYZSAHZU&list=PLH1ul2iNXl7vk8RUchIiMBeXqDnFTi4_M