

Launch VPC Wizard with Public and Private Subnet for WordPress with Bostion Host on AWS using Terraform

This task is almost same with last task with an additional feature to be added that is NAT Gateway to provide the internet access to instances running in the private subnet. I am using Terraform CLI for launch this whole setup on the top of AWS.

Task Overview:

Performing the following steps:

- Write an Infrastructure as code using terraform, which automatically create a VPC.
- In that VPC we have to create 2 subnets:

- 1. public subnet [Accessible for Public World!]
- 2. private subnet [Restricted for Public World!]
 - Create a public-facing internet gateway to connect our VPC/Network to the internet world and attach this gateway to our VPC.
- Create a routing table for Internet gateway so that instance can connect to the outside world, update, and associate it with the public subnet.
- Create a NAT gateway to connect our VPC/Network to the internet world and attach this gateway to our VPC in the public network
- Update the routing table of the private subnet, so that to access the internet it uses the Nat gateway created in the public subnet
- Launch an ec2 instance that has WordPress setup already having the security group allowing port 80 so that our client can connect to our WordPress site. Also, attach the key to the instance for further login into it.
- Launch an ec2 instance that has MYSQL setup already with security group allowing port 3306 in a private subnet so that our WordPress VM can connect with the same. Also, attach the key with the same.

Note:

- WordPress instance must be part of the public subnet so that our client can connect our site.
- MySQL instance must be part of a private subnet so that the outside world can't connect to it.
- Don't forget to add auto IP assign and auto DNS name assignment option to be enabled.

Task Description:

I create a file having .tf extension with all the code. I'm discussing the code part by part here.

1. Creating a VPC:

For creating VPC, Code is:

```
resource "aws_vpc" "wpvpc" {
  cidr_block = "10.7.0.0/16"
  enable_dns_hostnames = true
  tags = {
    Name = "main"
  }
}
```

This create one VPC with enabling DNS hostname.

2. Create one Public Subnet:

For creating a Public Subnet, you need to create one Internet gateway and also one routing table.

```
resource "aws subnet" "alpha-1a" {
 vpc id = "${aws vpc.wpvpc.id}"
  availability_zone = "ap-south-1a"
  cidr block = "10.7.1.0/24"
 map public ip on launch = true
 tags = {
   Name = "main-1a"
resource "aws internet gateway" "gw" {
 vpc id = "${aws vpc.wpvpc.id}"
 tags = {
   Name = "main-1a"
resource "aws_route_table" "rt" {
 vpc id = "${aws vpc.wpvpc.id}"
   cidr block = "0.0.0.0/0"
   gateway id = "${aws internet gateway.gw.id}"
  tags = {
   Name = "main-1a"
```

Now your Public Subnet is launched and one routing Table also. But for attaching the routing table to Subnet, we need to write some more code...

```
resource "aws_route_table_association" "ra" {
  subnet_id = aws_subnet.alpha-la.id
  route_table_id = aws_route_table.rt.id
}
```

Now my Public Subnet is created for connecting with the Internet.

3. Create one Public Subnet:

This part is also same as the previous step, yet we do not want to connect with the outer world as we make it private so don't create any Internet Gateway.

Now as our need, one more thing we want that our private subnet can connect to internet for some important update but No one can connect to this for security reason. For this, we have one concept of **Source Network Address Translation** in networking. AWS has one subservice inside VPC called **NAT Gateway** for this.

Code for launch NAT gateway:

```
resource "aws_eip" "lb" {
   vpc = true
}

resource "aws_nat_gateway" "gw" {
   allocation_id = "${aws_eip.lb.id}"
   subnet_id = "${aws_subnet.alpha-la.id}"
   depends_on = [ "aws_internet_gateway.gw" ]
}
```

You need one EIP too for creating NAT Gateway. Make sure you make it in your Public Subnet either you do not connect to Internet.

Now for connecting this to our private subnet, we need to create one routing Table and associate it with our Private Subnet.

```
resource "aws_route_table" "nat-table" {
   vpc_id = "${aws_vpc.myvpc.id}"
   route {
      cidr_block = "0.0.0.0/0"
      gateway_id = "${aws_nat_gateway.gw.id}"
   }
   tags = {
      Name = "main-lb"
   }
}
resource "aws_route_table_association" "nat-b" {
   subnet_id = aws_subnet.alpha-lb.id
```

```
route_table_id = aws_route_table.nat-table.id
}
```

Now my Private Subnet is launched and also, we can access Internet from this.

4. Launch one EC2 instance for WordPress with allowing http port on security Group:

For doing SSH, we need to provide one Key to it, for creating a Key...

```
resource "tls_private_key" "key_create" {
    algorithm = "RSA"
}

resource "aws_key_pair" "taskkey" {
    key_name = "taskkey"
    public_key = "${tls_private_key.key_create.public_key_openssh}"
}

output "key-pair" {
    value = tls_private_key.key_create.private_key_pem
}

resource "local_file" "save_key" {
    content = tls_private_key.key_create.private_key_pem
    filename = "taskkey.pem"
}
```

Now next step is creating one Security Group allowing SSH, Https and Http port...

```
resource "aws security group" "allow http wordpress" {
 name = "allow http wordpress"
  description = "Allow HTTP inbound traffic"
 vpc id = "${aws vpc.wpvpc.id}"
  ingress {
   description = "Http from VPC"
   from_port = 80
  to_port = 80
protocol = "tcp"
   cidr blocks = ["0.0.0.0/0"]
  ingress {
   description = "SSH from VPC"
   from_port = 22
  to_port = 22
protocol = "tcp"
   cidr blocks = ["0.0.0.0/0"]
 ingress {
   description = "HTTPS"
   from port = 443
  to port = 443
```

```
protocol = "tcp"
  cidr_blocks = [ "0.0.0.0/0" ]
}
egress {
  from_port = 0
  to_port = 0
  protocol = "-1"
  cidr_blocks = ["0.0.0.0/0"]
}
tags = {
  Name = "wpsgroup"
}
```

For launching your wordpress instance, code is...

Now my WordPress is launched.

Now let me explain a little more why we need one NAT Gateway?

As MySQL instance is a part of our private subnet so that no one from outside world connect/hack our database. But we also need to do update the software. For this usecase, we need a NAT Gateway.

So for going inside the instance, we need to attach a key and allow SSH to the security group but it is not good to provide permission to everyone. Here concept of **Bastion Host** comes up... Using this OS, you can do SSH only to go inside the MySQL instance. Now come to the next step...

5. Launch one EC2 instance to launch Bastion Host:

We launched this instance in the public Subnet and create one security group for allowing SSH.

```
resource "aws security group" "bostion-sg" {
  name = "bostion-sg"
  description = "SSH to bostion-host"
  vpc id = "${aws vpc.wpvpc.id}"
  ingress {
   description = "SSH from VPC"
   from_port = 22
to_port = 22
protocol = "tcp"
    cidr blocks = ["0.0.0.0/0"]
  egress {
   from_port = 0
   to_port = 0
protocol = "-1"
   cidr blocks = ["0.0.0.0/0"]
  tags = {
   Name = "sgroup"
resource "aws instance" "bostion-host" {
 ami = "ami-00b494a3f139ba61f"
  instance_type = "t2.micro"
 key name = var.enter ur key name
  availability_zone = "ap-south-1a"
  subnet id = "${aws subnet.alpha-1a.id}"
  vpc_security_group_ids = [ "${aws_security_group.bostion-sg.id}" ]
  tags = {
   Name = "bostion-host"
```

6. Launch one EC2 instance for MySQL Database:

For this, we need to provide a key for login inside the instance but also we make one security group to restrict the access through SSH by giving security group as source we create for Bostion Host and also allow MYSQL port.

```
cidr blocks = [ "0.0.0.0/0" ]
 ingress {
   description = "SSH from VPC"
   from_port = 22
  to_port = 22
protocol = "tcp"
   security groups = [ "${aws security group.bostion-sg.id}" ]
  egress {
   from\_port = 0
   to_port = 0
protocol = "-1"
   cidr blocks = ["0.0.0.0/0"]
  tags = {
  Name = "sgroup"
resource "aws_instance" "mysql" {
 ami = "ami-76166b19"
 instance_type = "t2.micro"
 key name = var.enter ur key name
 availability_zone = "ap-south-1b"
 subnet id = "${aws subnet.alpha-1b.id}"
 security groups = [ "${aws security group.mysql-sg.id}" ]
  tags = {
   Name = "MYSQL"
```

Now, MySQL database is launched.

Now my setup is completed.

For run the file, open your command prompt, and run these two commands:

- terraform init
- · terraform apply









