Passerelles numériques

A Gateway for Life

AWS VPC - Basics

AWS AMAZON

OBJECTIVe

1. What is VPC?
2. The VPC dashboard
3. Create a VPC
4. Subnet
5. Internet Gateway
6. Route table

What is VPC?

Amazon Virtual Private Cloud (VPC)

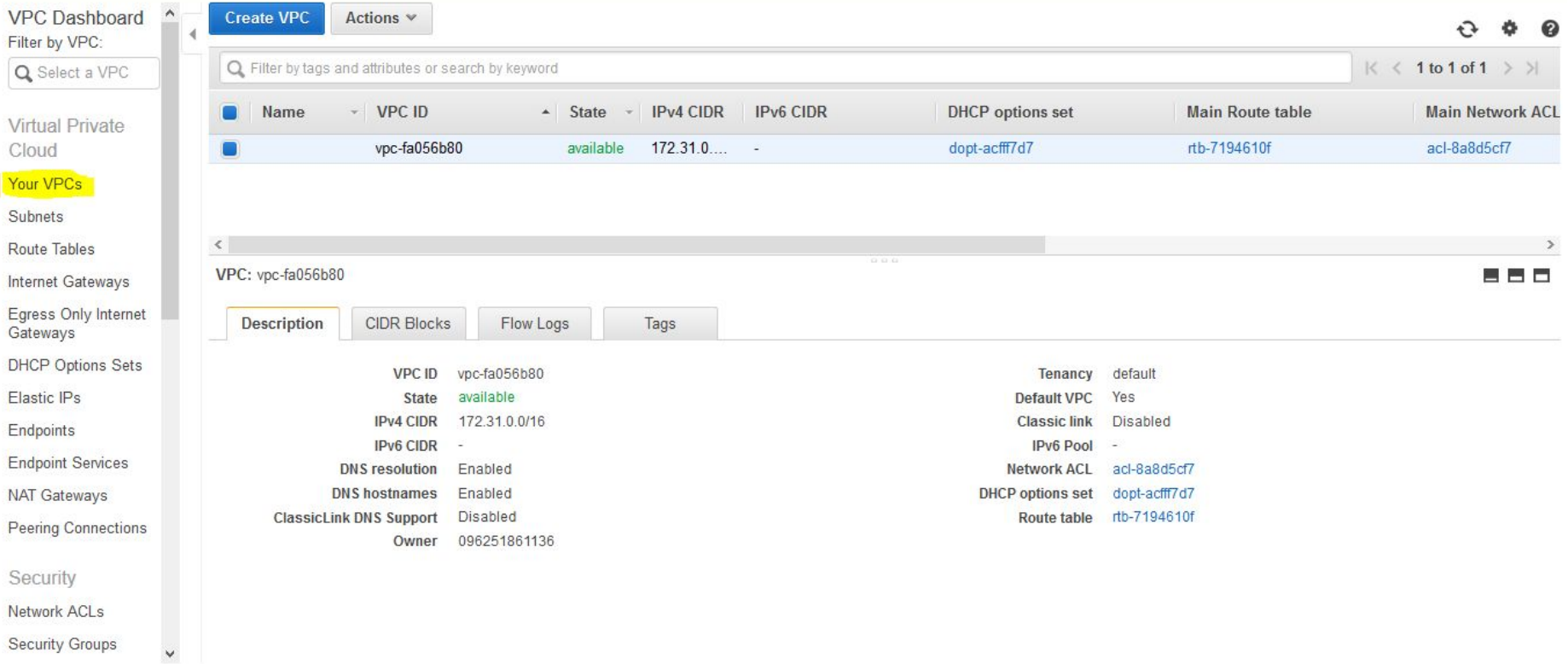
- A VPC is a network environment **linked to your AWS account** that you can **create in a few minutes!**
- With a VPC, you can launch your EC2 instances in **your own virtual network**
- You can use a **default VPC** (already created for you by AWS)
    - With default subnets in range 172.31.0.0/16 - *question: how many IP addresses are available?*
- You can also create additional VPCs that you can define and **customize** according to your needs
    - In that VPC you can choose your subnets, availability zones, customize IP address ranges (CIDR), and a lot more…
- An EC2 instance is always linked to one VPC (not possible more than one)
- By default, an EC2 instance is linked to your default VPC but you can configure your instance to be linked to another VPC you created
- It is similar to a real network, except that you don’t need any hardware to maintain because everything is **virtualized** and **hosted in AWS datacenters**

What is VPC?

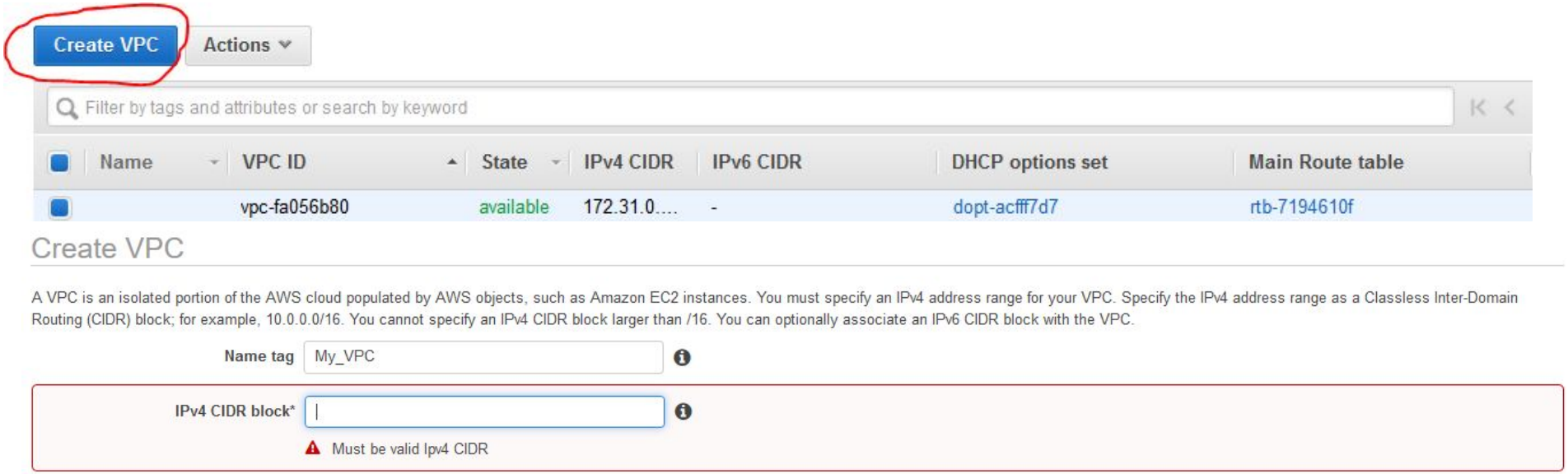
Why not using the default VPC?

- For lab and testing it is often enough to use the default VPC
- However, when you work for a company you will probably have to create your own custom VPC instead of using the default VPC
- The default VPC always use the IP addresses range 172.31.0.0/16 and you cannot change it!
- If you create your own VPC, you can also create your own subnets and you will have more control on the choice of IP addresses
- There are also many advanced AWS features that are not available with a default VPC

The VPC Dashboard



Create a VPC



CIDR block

- When creating a VPC, you will first be asked to configure a Classless Inter-Domain Routing (CIDR) block
- It is the IP address range you want to use for your VPC. Remember what you learned in network / Cisco course...
- For example 10.10.0.0/16 means all IP addresses between 10.10.0.0 and 10.10.255.255 (total 65 536 addresses)

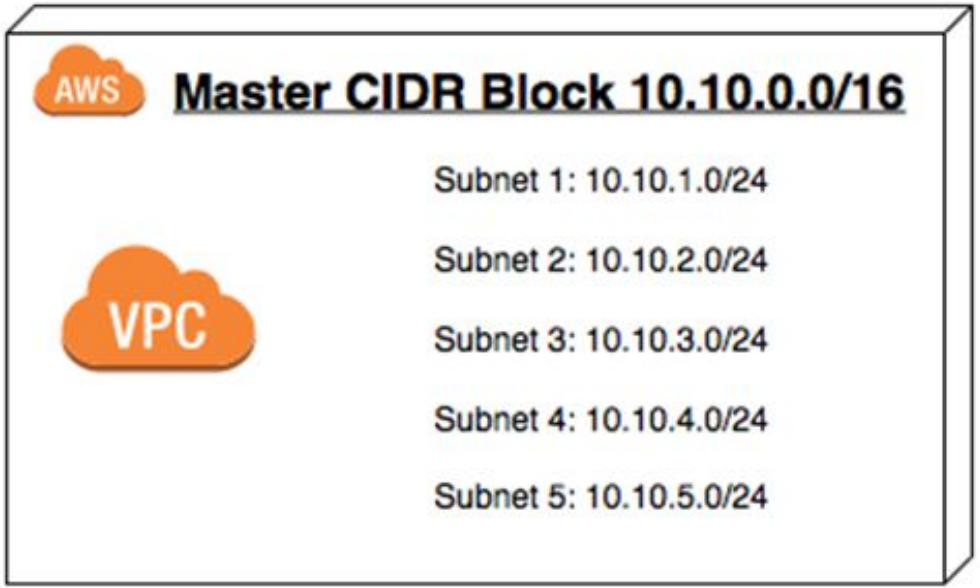
Create a VPC

- Create a new VPC
- Custom CIDR block

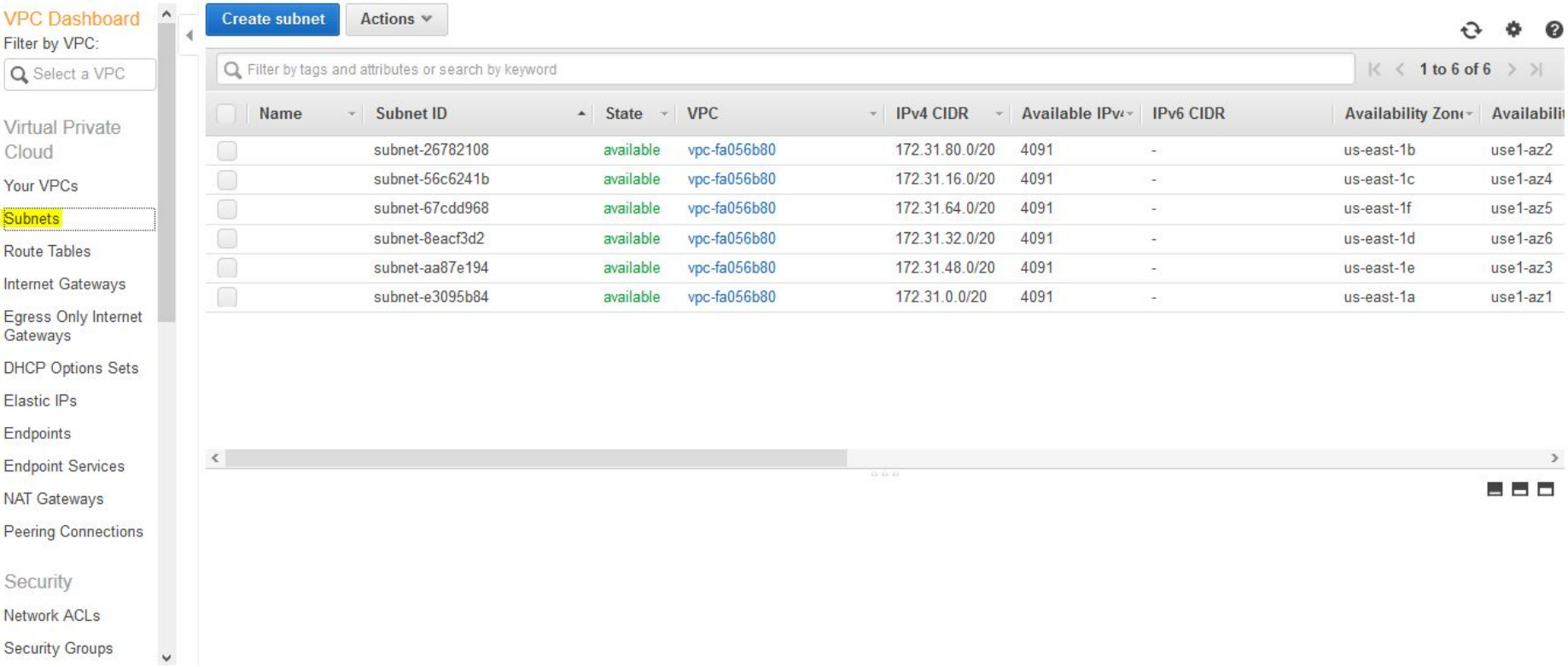
Subnet

What is a subnet?

- **Subnet** is the acronym for **sub-network**
- It is a range of IP addresses **within your VPC's CIDR block**
- A subnet is linked to a VPC
  - A **subnet can only have one VPC**
  - However a **VPC can have multiple subnets**
- An EC2 instance's **network interface should be assigned to a subnet**
- 2 types of subnets: **private** and **public**
  - **private subnet** only uses private IP addresses (instances not connected to the Internet)
  - **public subnet** uses private IP addresses + public IP addresses (connected to the Internet)



Subnet


VPC Dashboard
Filter by VPC:
Select a VPC
Virtual Private Cloud
Your VPCs
Subnets
Route Tables
Internet Gateways
Egress Only Internet Gateways
DHCP Options Sets
Elastic IPs
Endpoints
Endpoint Services
NAT Gateways
Peering Connections
Security
Network ACLs
Security Groups
Create subnet
Actions
Filter by tags and attributes or search by keyword
1 to 6 of 6
Name
Subnet ID
State
VPC
IPv4 CIDR
Available IPv4
IPv6 CIDR
Availability Zone
Availabili
subnet-26782108 available vpc-fa056b80 172.31.80.0/20 4091 - us-east-1b use1-az2
subnet-56c6241b available vpc-fa056b80 172.31.16.0/20 4091 - us-east-1c use1-az4
subnet-67cdd968 available vpc-fa056b80 172.31.64.0/20 4091 - us-east-1f use1-az5
subnet-8eacf3d2 available vpc-fa056b80 172.31.32.0/20 4091 - us-east-1d use1-az6
subnet-aa87e194 available vpc-fa056b80 172.31.48.0/20 4091 - us-east-1e use1-az3
subnet-e3095b84 available vpc-fa056b80 172.31.0.0/20 4091 - us-east-1a use1-az1

Subnet

- Create 2 different subnets A and B
- Assign an instance to the new VPC and subnet A
- Assign a new secondary network interface to the other subnet B
- Make subnet A public
- Assign public and private subnets to a new instance

Internet Gateway

What is an Internet Gateway?

- An **Internet Gateway** is required to **connect your VPC and your instances to Internet**
- It **acts like a router** in a normal network to **route traffic** for IP addresses **outside your VPC**
- It allows communication **between instances in your VPC and the internet**
- An Internet Gateway should be **attached to your VPC**
- You can have **only one Internet Gateway per VPC**
- An Internet Gateway is **simple to configure**:
    - you just need to **attach the Internet Gateway to a VPC**
- However you need to update your **route tables**

  if you want to use your Internet Gateway
    - *We will see that in a moment…*

Internet Gateway

- Create a new Internet Gateway
- Assign the new Internet Gateway

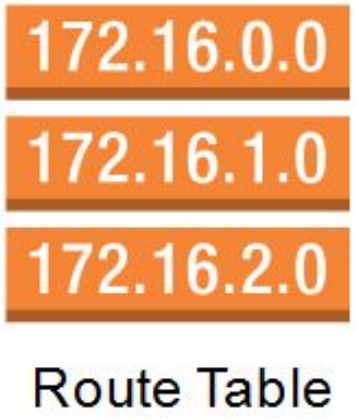
  to the new VPC

Route Table

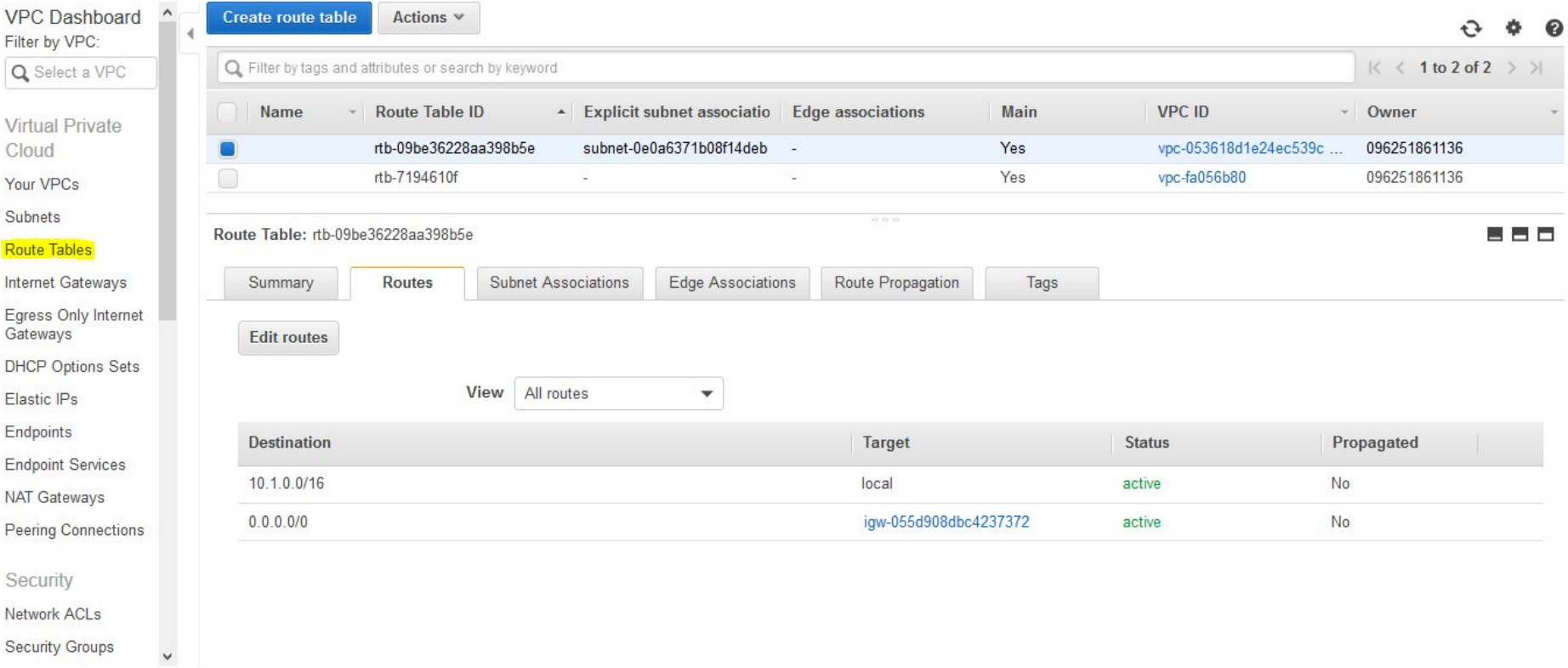
What is a route table?

- A **route table** in AWS **acts the same way as a route table in a normal router** (Mikrotik, Cisco, etc.)
- A route table is **assigned to a specific subnet**
- If you want your public subnet and your instances in this subnet to be reachable from Internet, you need to configure the route table on this subnet
- In this route table, you should create a route to **redirect all traffic outside your VPC to your Internet Gateway**
    - Remember, 0.0.0.0/0 means “all traffic”

IMPORTANT: Remember that your instance cannot be reachable from Internet if you don’t configure the route table to redirect all traffic to your VPC’s Internet Gateway



Route Table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Elastic IPs
Endpoints
Endpoint Services
NAT Gateways
Peering Connections
Security
Network ACLs
Security Groups
Create route table
Actions
Filter by tags and attributes or search by keyword
1 to 2 of 2
Name
Route Table ID
Explicit subnet associatio
Edge associations
Main
VPC ID
Owner
rtb-09be36228aa398b5e
subnet-0e0a6371b08f14deb
-
Yes
vpc-053618d1e24ec539c ...
096251861136
rtb-7194610f
-
-
Yes
vpc-fa056b80
096251861136
Route Table: rtb-09be36228aa398b5e
Summary
Routes
Subnet Associations
Edge Associations
Route Propagation
Tags
Edit routes
View
All routes
Destination
Target
Status
Propagated
10.1.0.0/16
local
active
No
0.0.0.0/0
igw-055d908dbc4237372
active
No

Route Table

- Identify the route table linked to your public subnet
- Create a new route to route all traffic outside your VPC to the Internet Gateway
- Check the updated route table on your public subnet
- Finally, now you can connect to your instance in your public subnet!

What's next

What we have learned in this module

- What is a VPC
- Why you need to create your own VPC
- How to create your first VPC
- How to configure a Subnet
- How to configure an Internet Gateway
- How to configure a Route table
- How to connect an EC2 instance to your new VPC and subnets

What we will learn in the next modules

- How to use NAT
- How to work with Network ACL
- How to do VPC Peering to connect multiple VPCs
- How to automatically create instances for a website using AWS ElasticBeanstalk
- How to use DNS and administer a domain name using AWS Route53
- And a lot more…..

Questions

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