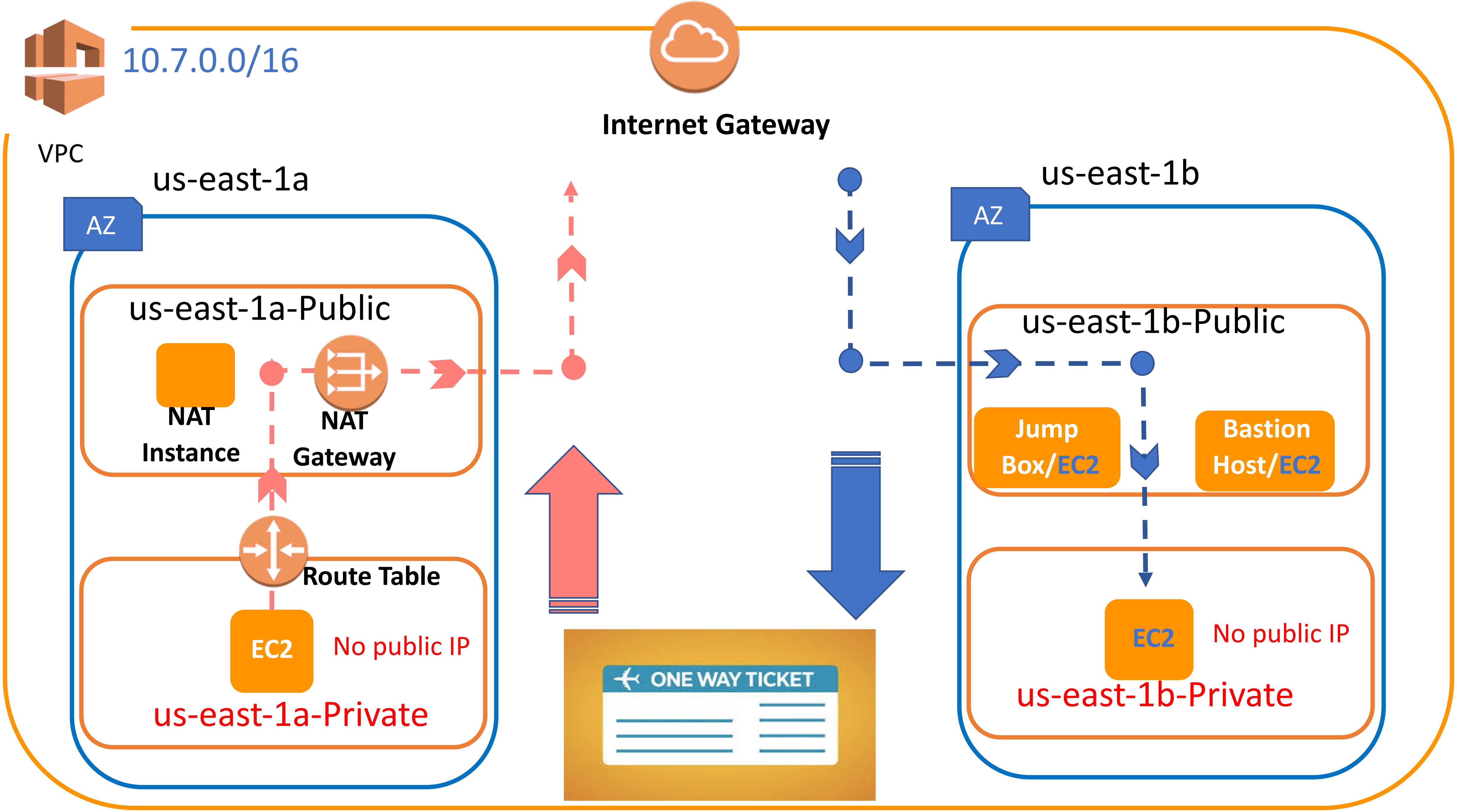
VPC LAB

Serdar

12/10/2020



10.7.0.0/16

VPC

Internet Gateway

us-east-1a

AZ

us-east-1a-Public

NAT Instance

NAT Gateway

Route Table

EC2

No public IP

us-east-1a-Private

ONE WAY TICKET

us-east-1b

AZ

us-east-1b-Public

Jump Box/EC2

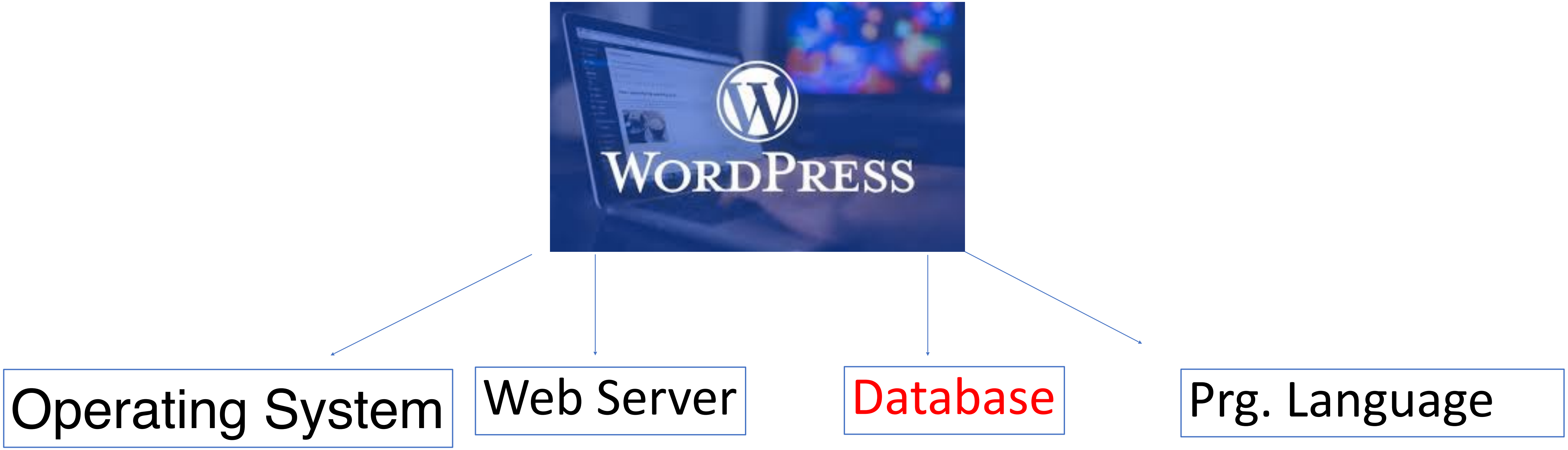
Bastion Host/EC2

EC2

No public IP

us-east-1b-Private

Dynamic Website



Operating System

Web Server

Database

Prg. Language

Setup Wordpress with Database

LAMP stands for Linux, Apache, MySQL, and PHP. LAMP is an open source Web development platform Linux is the operating system with **Apache** web server and **MySQL** Database that uses **PHP** to process dynamic website content.

Operating System | Web Server | Database | Progr. language

User Data

LAMP: ✓

Installed-ready

MySQL
php
Linux
Apache
MySQL
PHP

EC2 Amazon Linux 2

✓

Ready

User Data

✓

Installed-ready

?

V

V

User Data

✓

Installed-ready

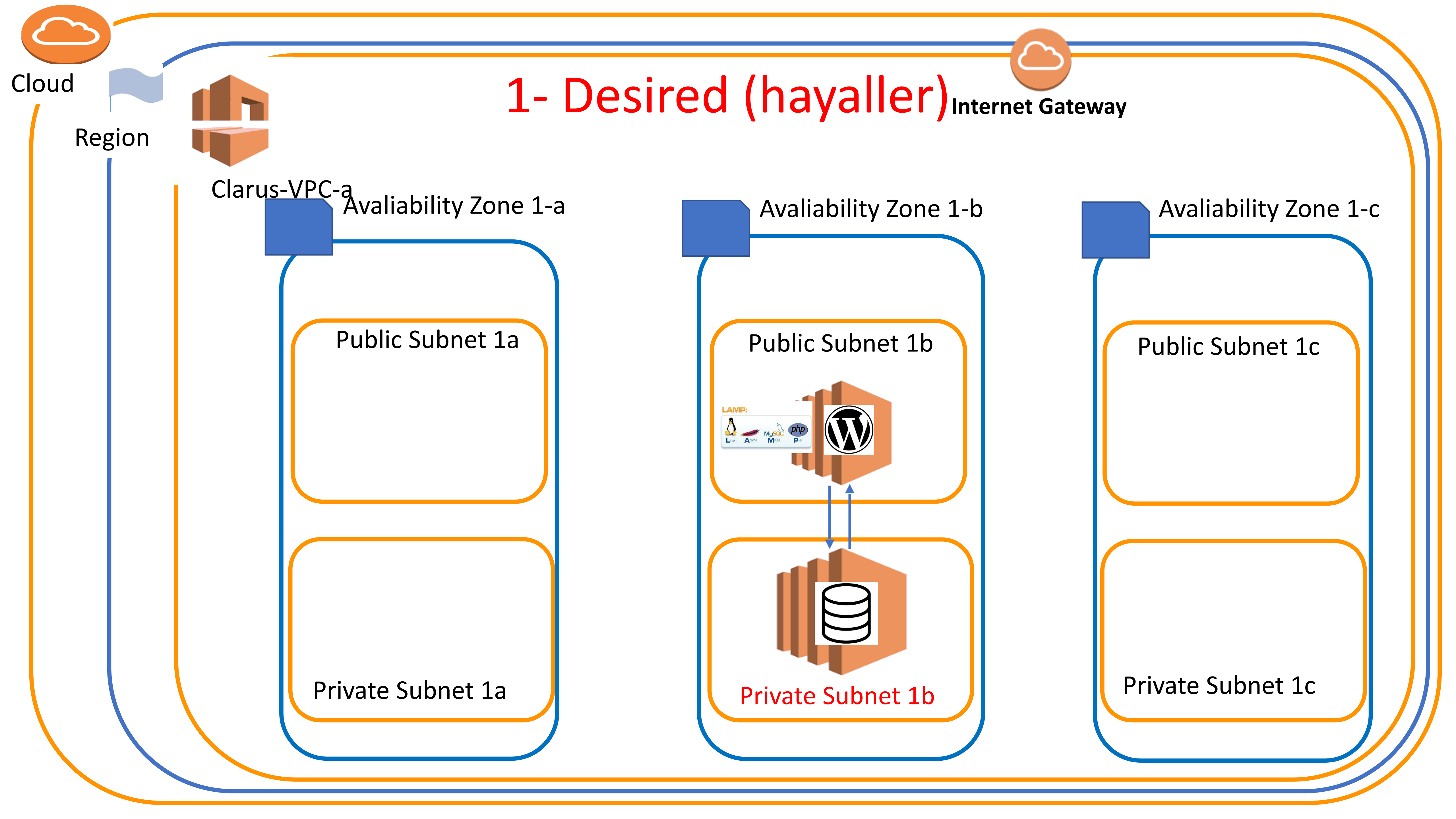
User Data

✓

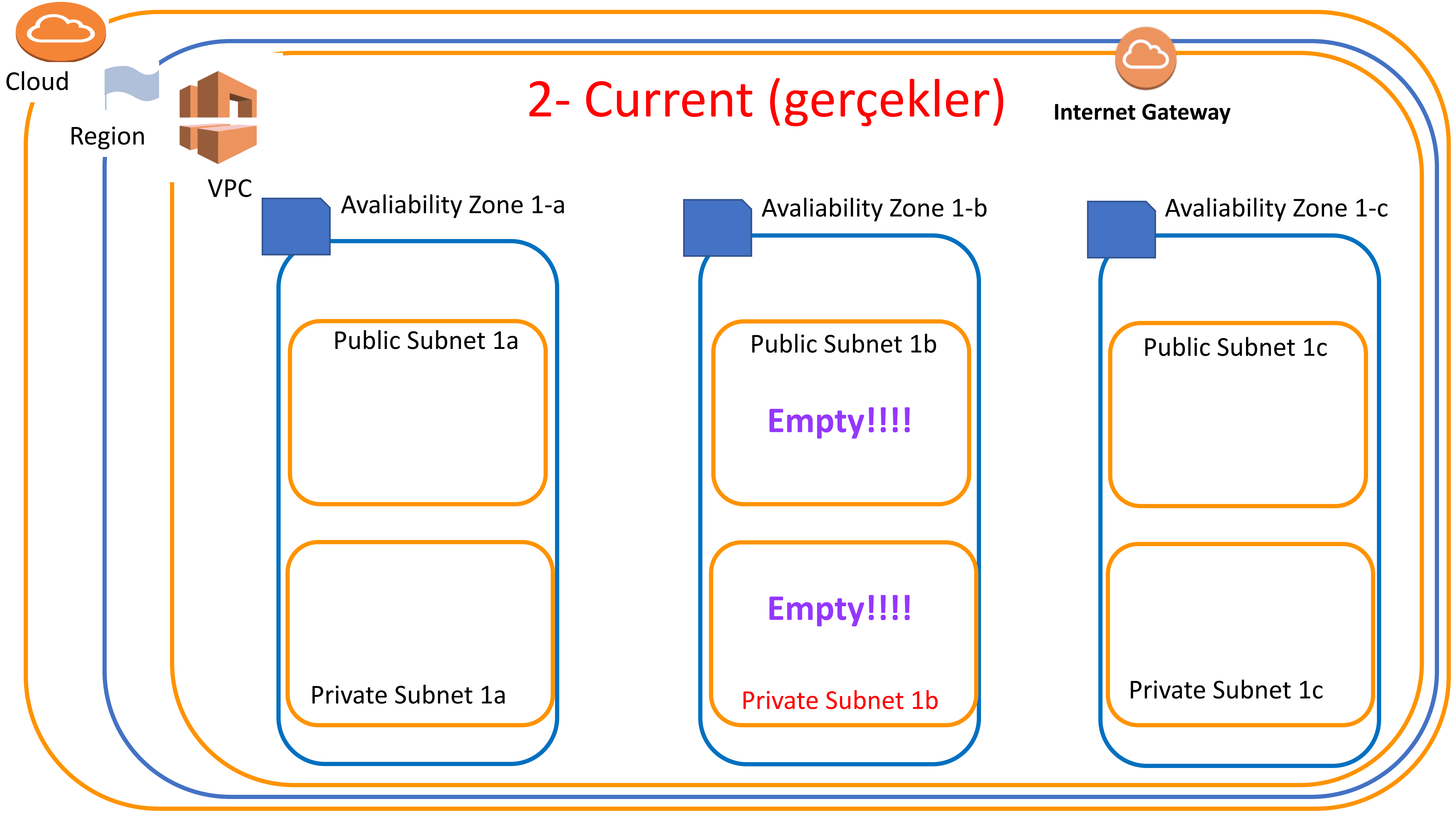
Installed-ready

It is in another instance in the private Subnet

1- Desired (hayaller)



2- Current (gerçekler)



Cloud

Region

VPC

Internet Gateway

Avaliability Zone 1-a

Public Subnet 1a

Private Subnet 1a

Avaliability Zone 1-b

Public Subnet 1b

Empty!!!!

Empty!!!!

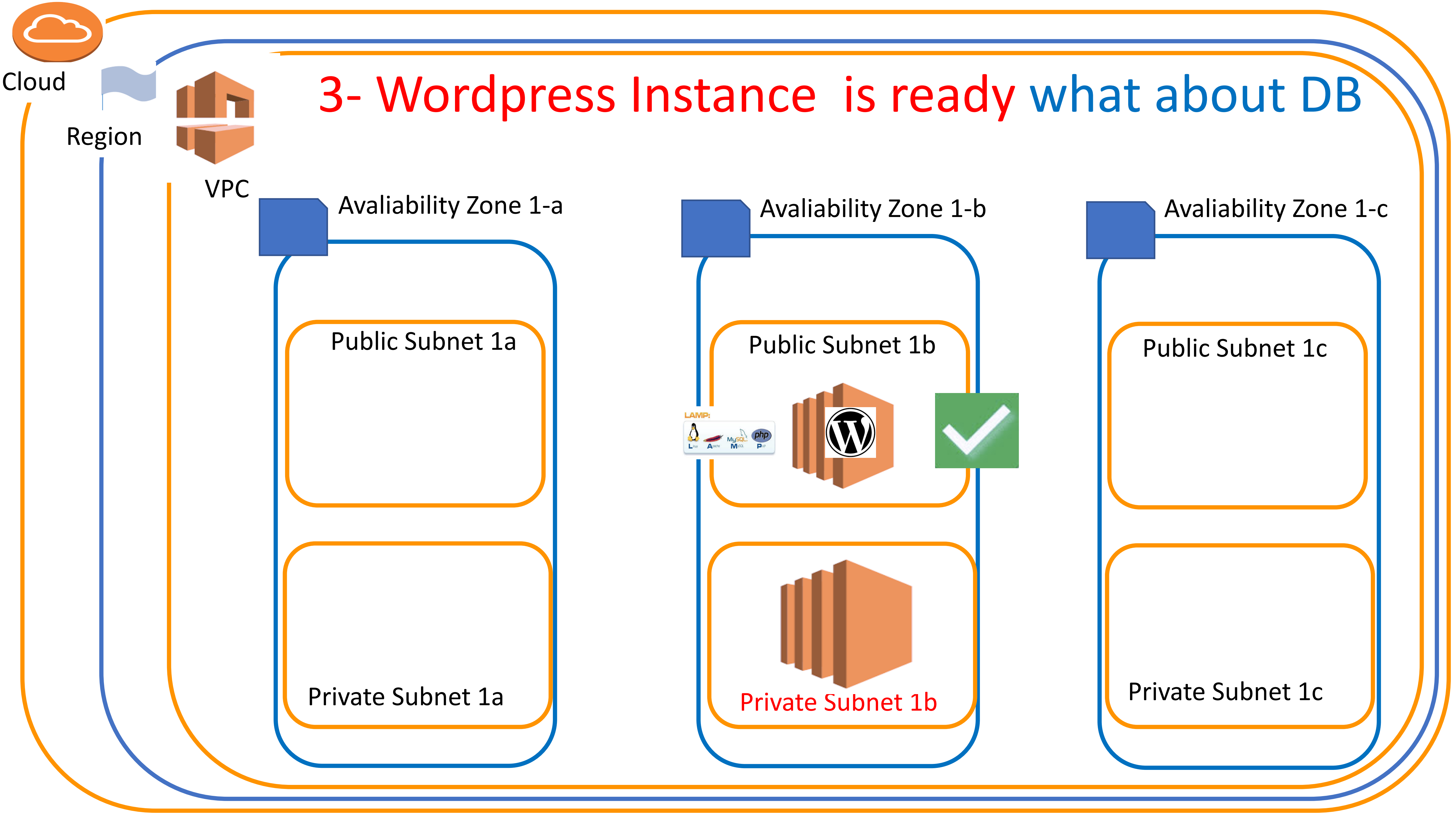
Private Subnet 1b

Avaliability Zone 1-c

Public Subnet 1c

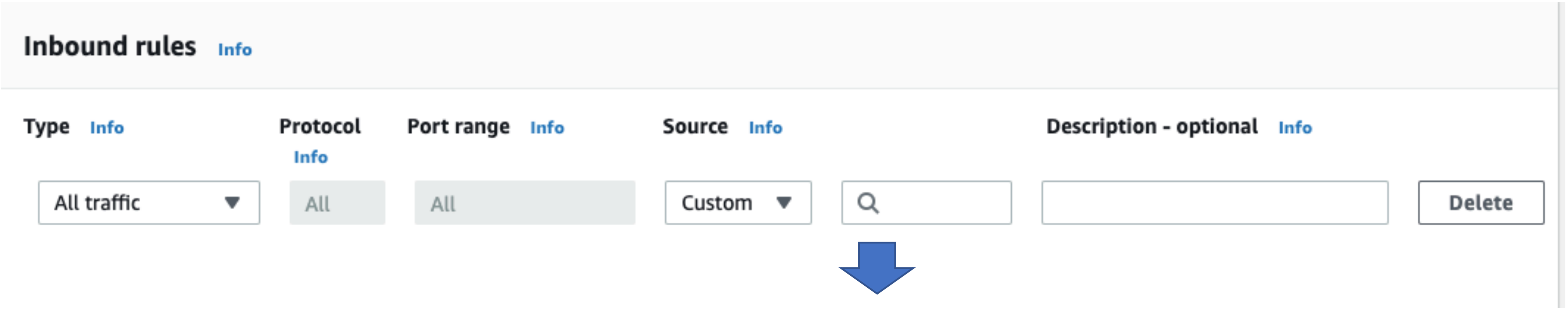
Private Subnet 1c

3- Wordpress Instance is ready what about DB



Sec. Group Issue

Bastion Host



Inbound rules Info

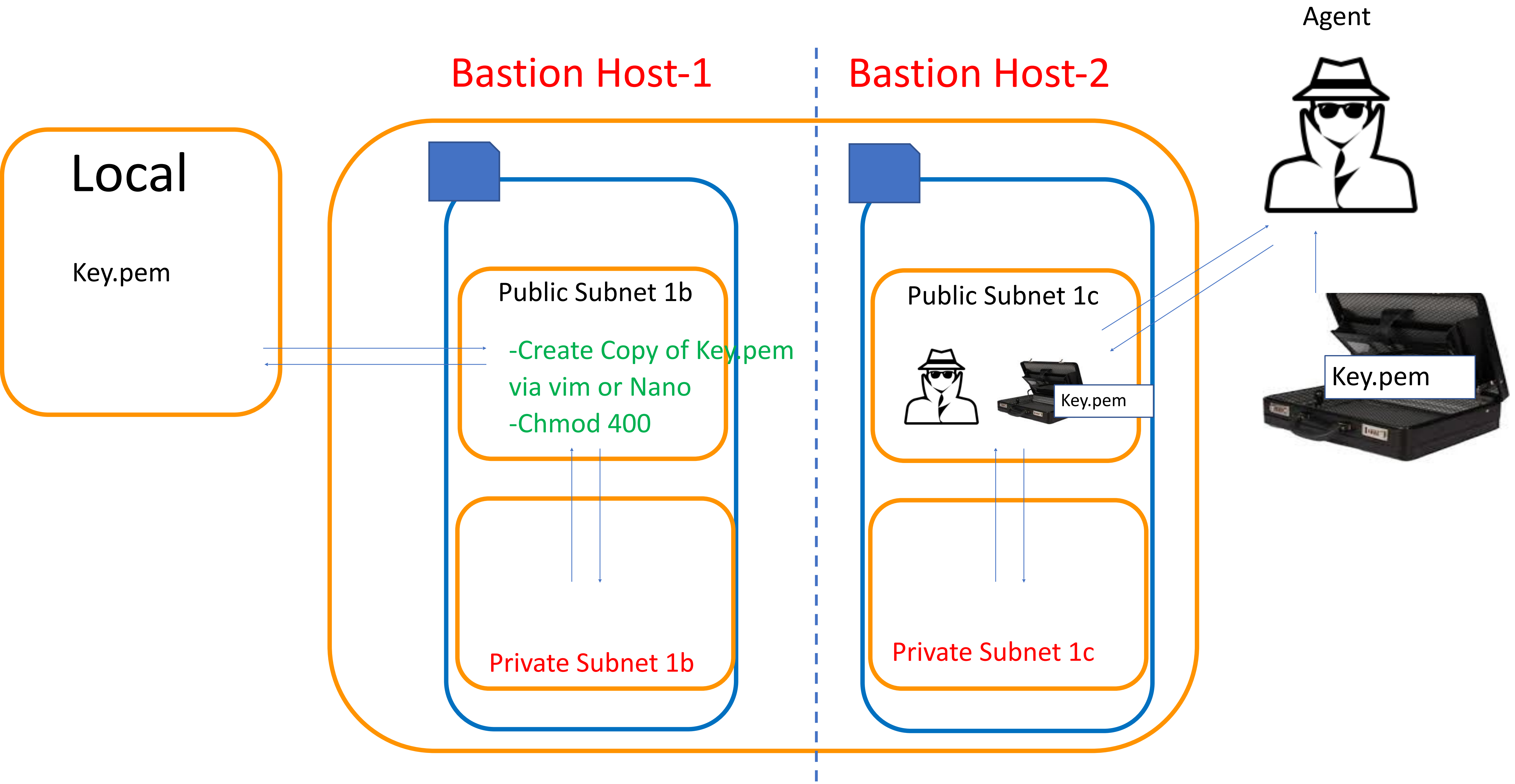
Type Info	Protocol Info	Port range Info	Source Info		Description - optional Info	
All traffic ▼	All	All	Custom ▼	🔍		Delete

1-Sec. group of Bastion Host –Best practice

2-CIDR Block of “Public Subnet”

3-IP of Bastion Host Instance

.pem Issue



Agent

Bastion Host-1

Bastion Host-2

Local

Key.pem

Public Subnet 1b

-Create Copy of Key.pem
via vim or Nano
-Chmod 400

Private Subnet 1b

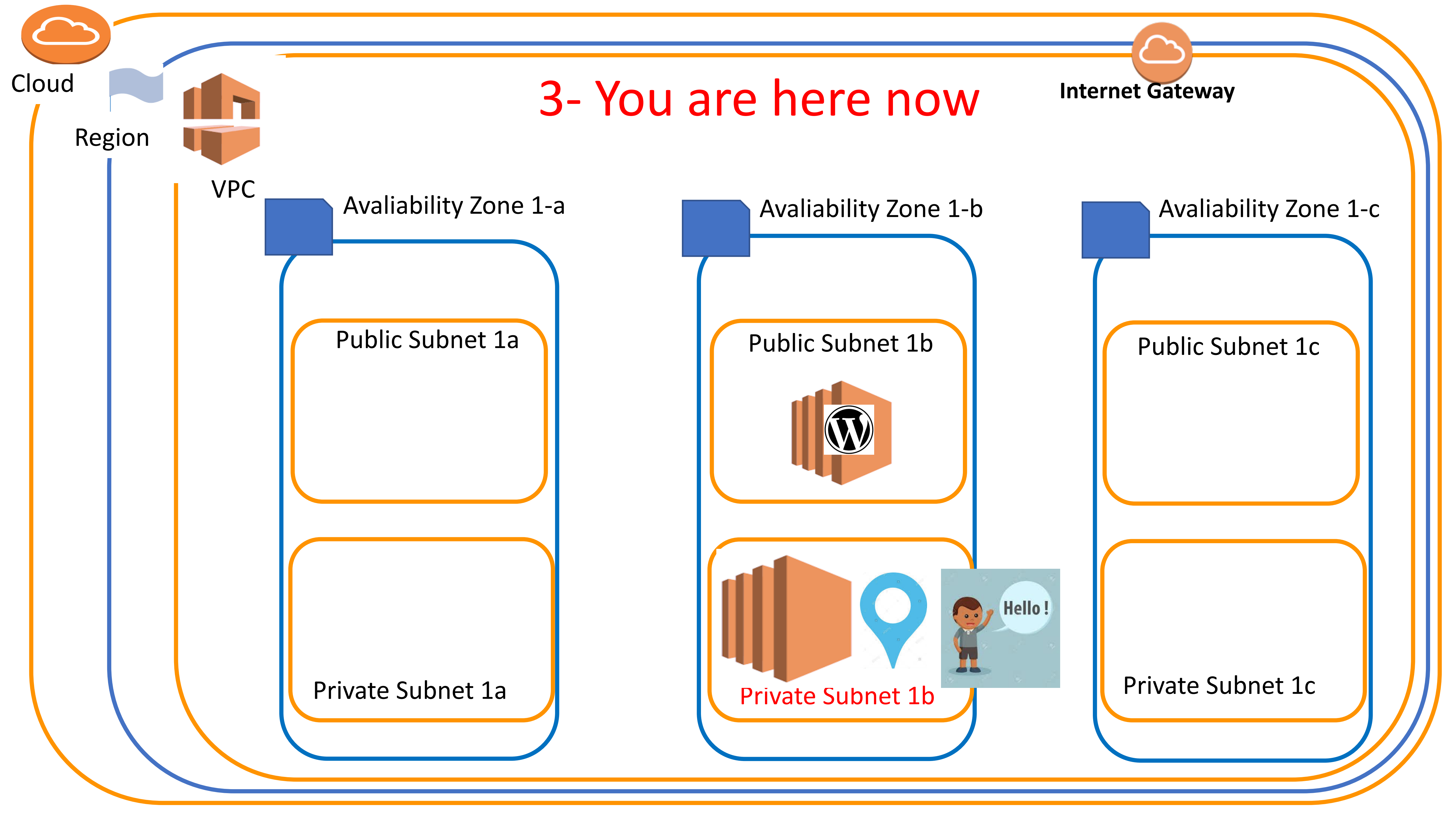
Public Subnet 1c

Key.pem

Private Subnet 1c

Key.pem

3- You are here now



Cloud

Region

VPC

Internet Gateway

Avaliability Zone 1-a

Public Subnet 1a

Private Subnet 1a

Avaliability Zone 1-b

Public Subnet 1b

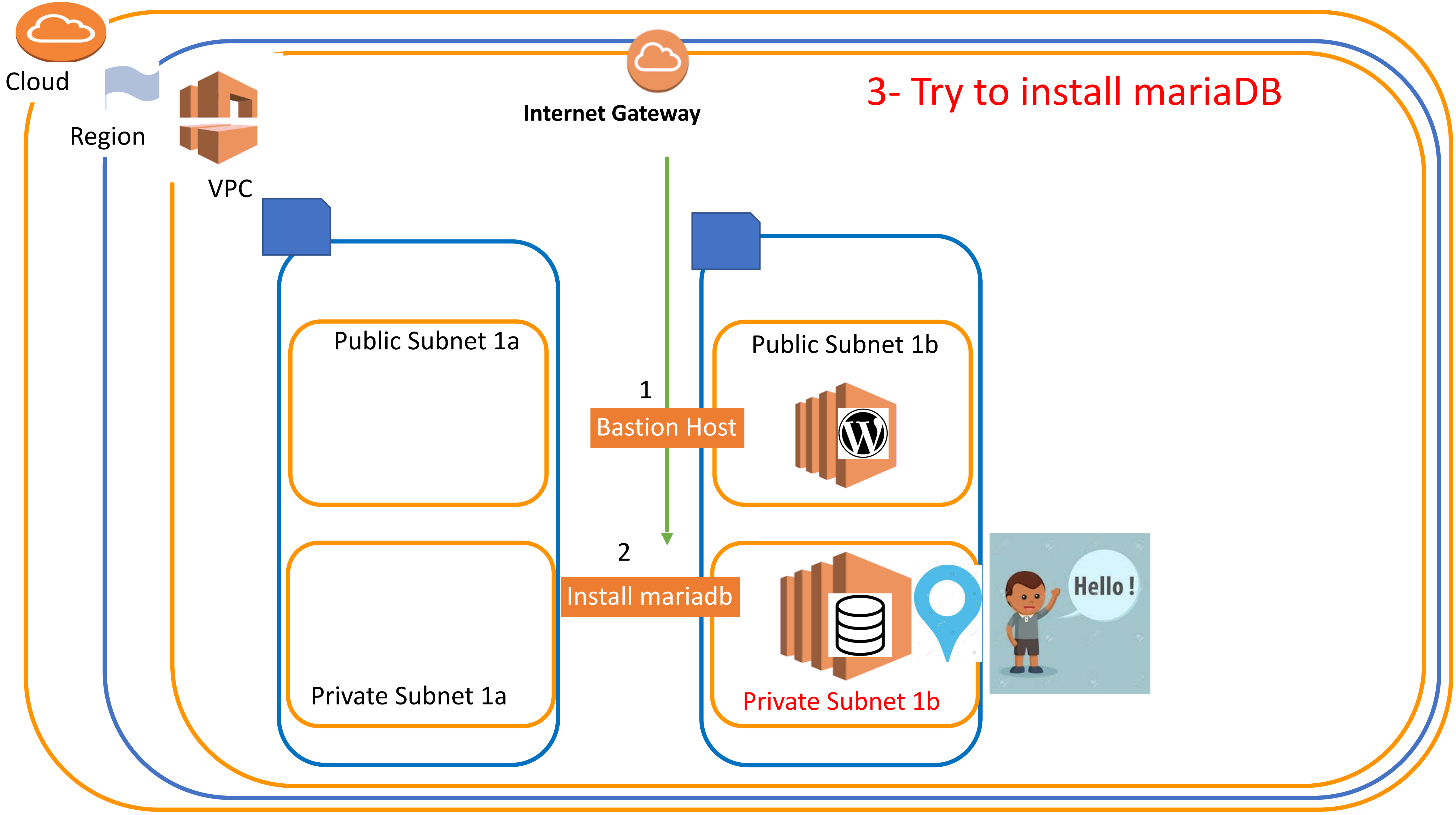
Private Subnet 1b

Avaliability Zone 1-c

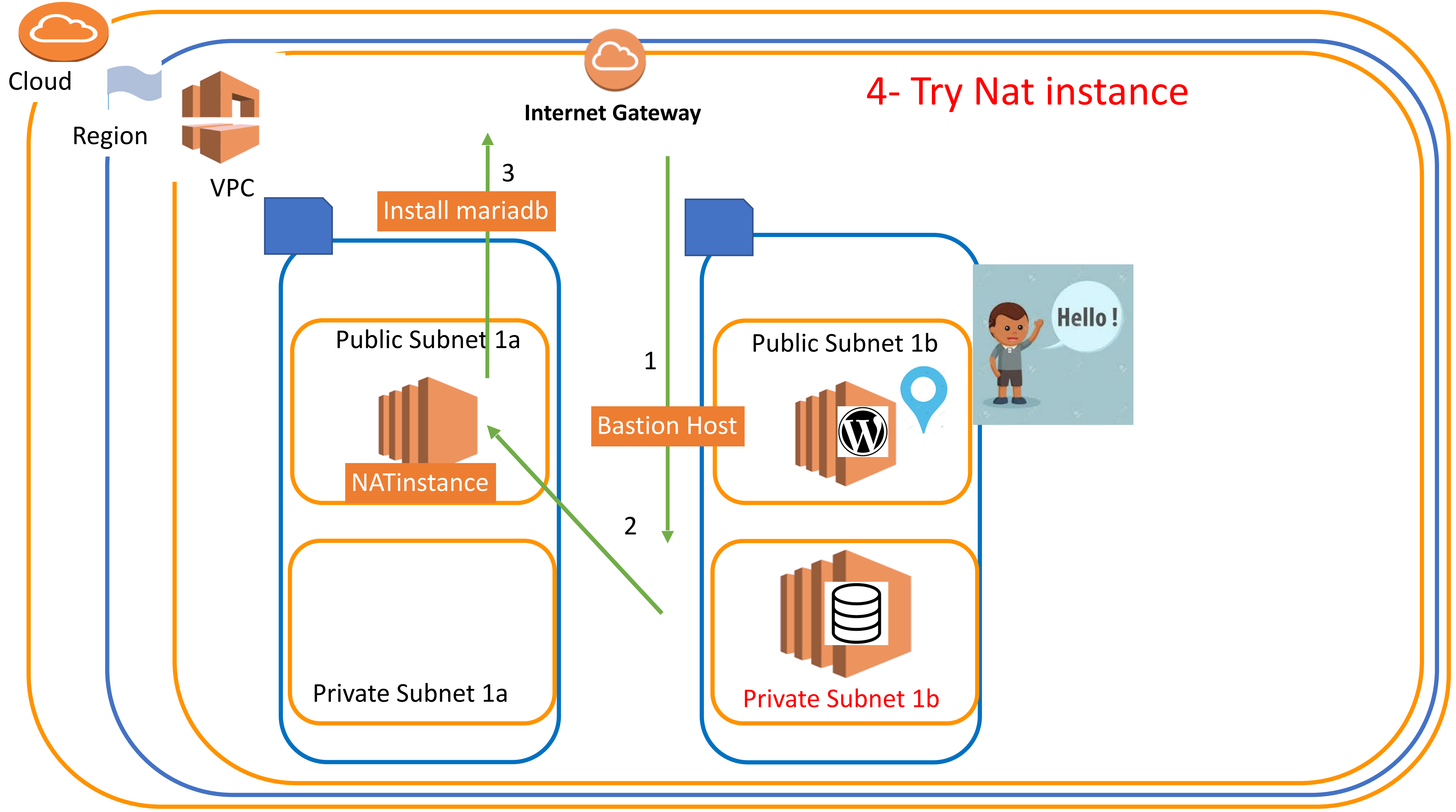
Public Subnet 1c

Private Subnet 1c

3- Try to install mariaDB

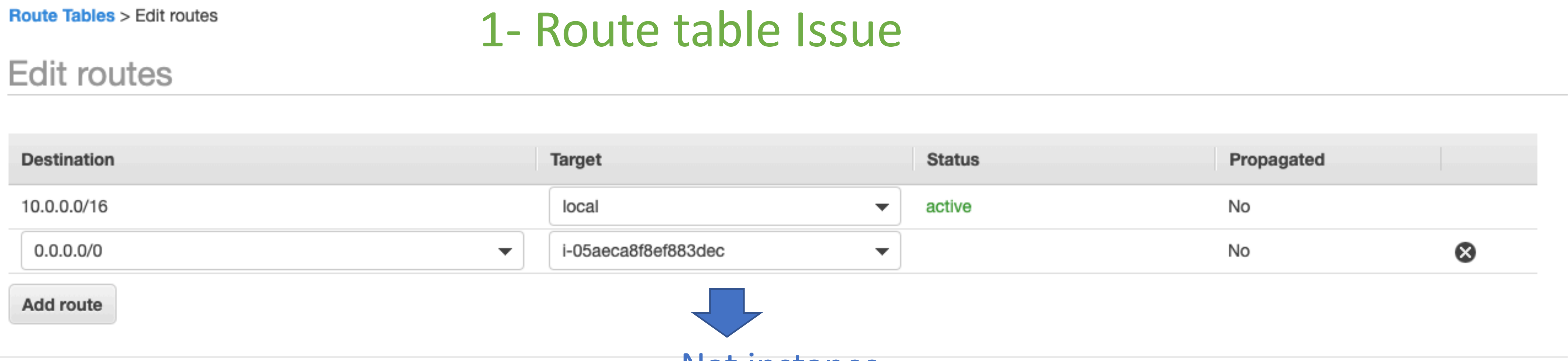


4- Try Nat instance



Nat instance

1- Route table Issue



Route Tables > Edit routes

Edit routes

Destination	Target	Status	Propagated	
10.0.0.0/16	local	active	No	
0.0.0.0/0	i-05aeca8f8ef883dec		No	⊗

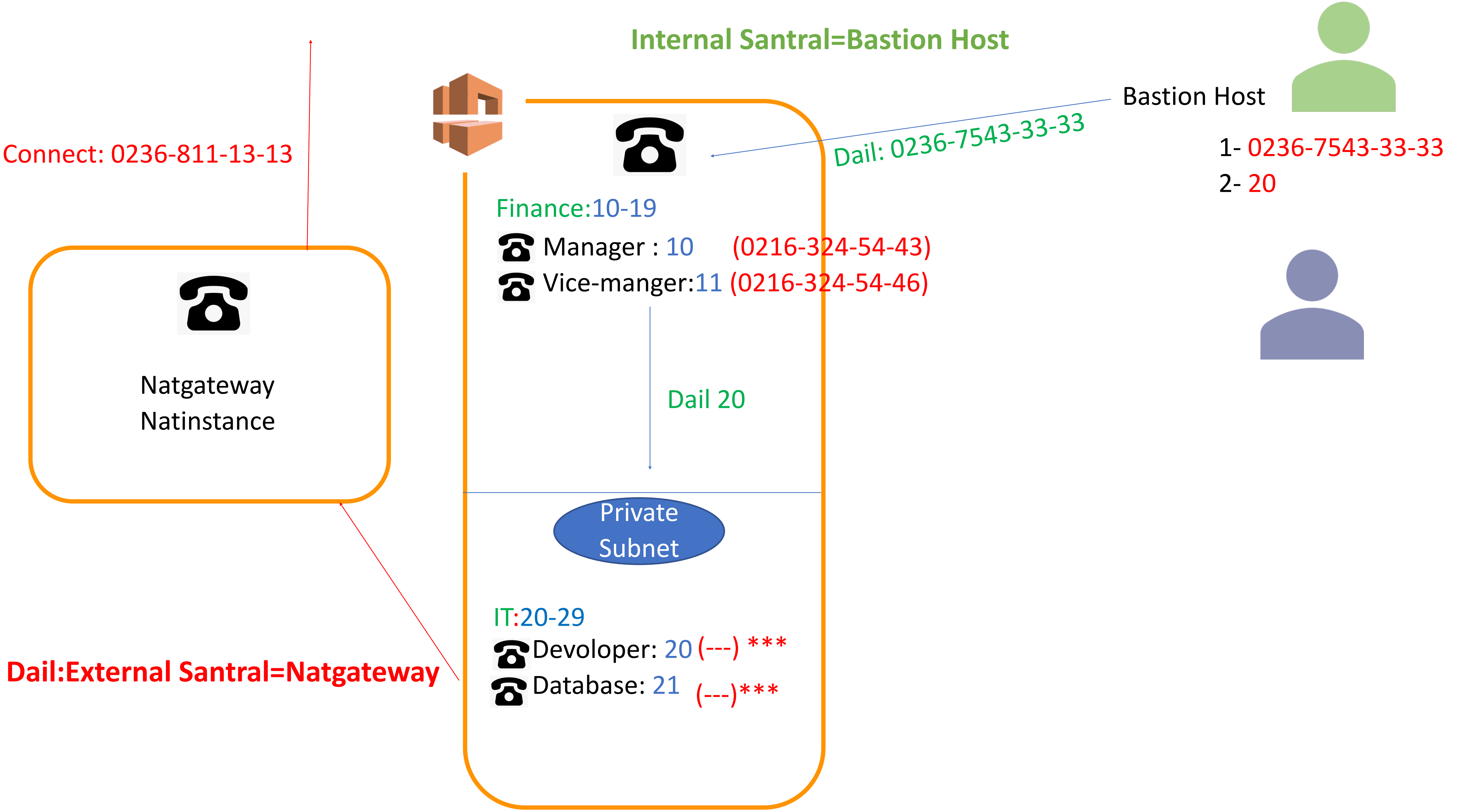
Add route

- Nat instance

2- Change Source/ Destination Check

- Disable

Internal Santral=Bastion Host



Connect: 0236-811-13-13

Natgateway

Natinstance

Dail:External Santral=Natgateway

Finance:10-19

☎ Manager : 10 (0216-324-54-43)

☎ Vice-manger:11 (0216-324-54-46)

Dail 20

Private Subnet

IT:20-29

☎ Devoloper: 20 (---) ***

☎ Database: 21 (---)***

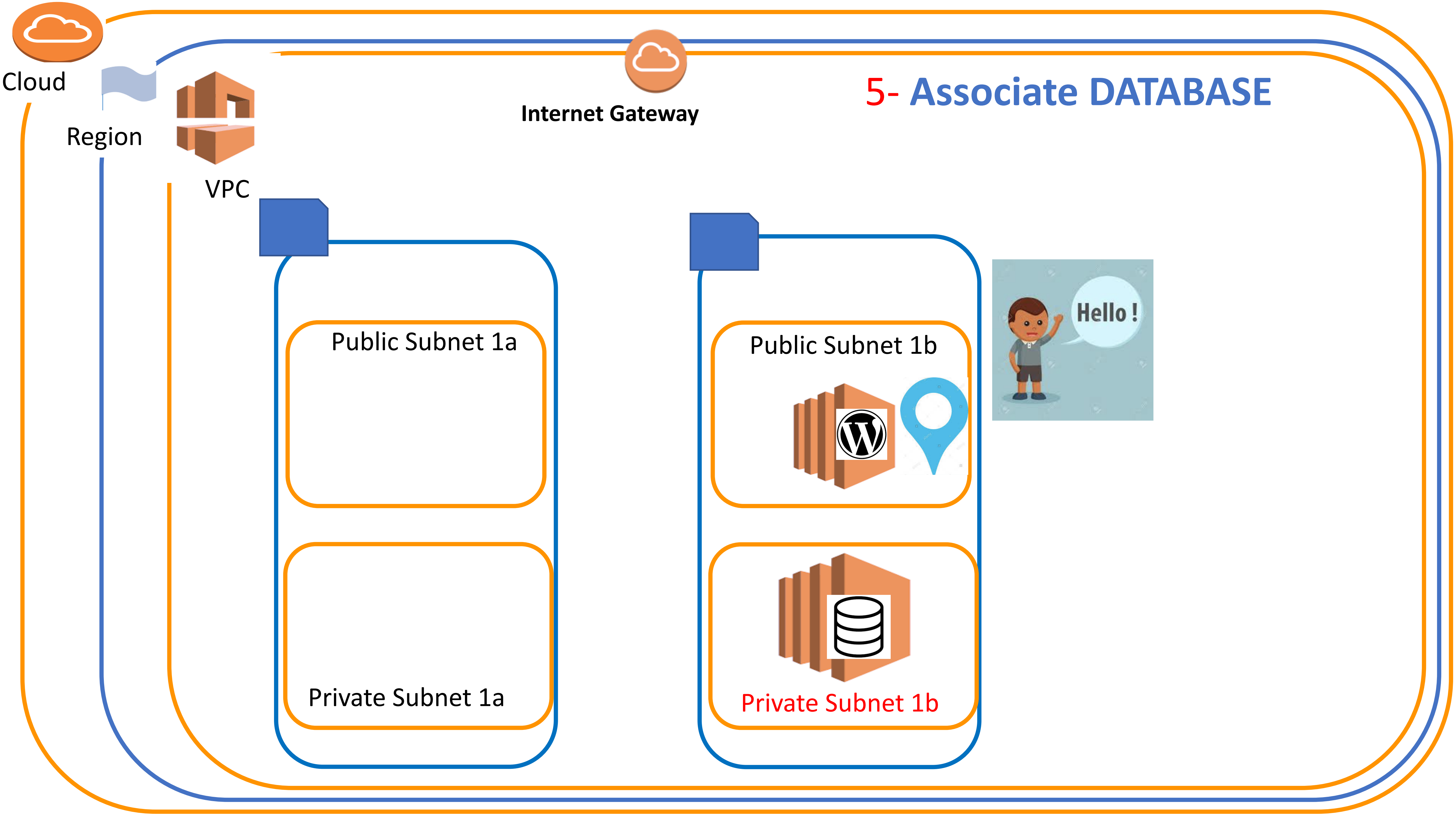
Dail: 0236-7543-33-33

Bastion Host

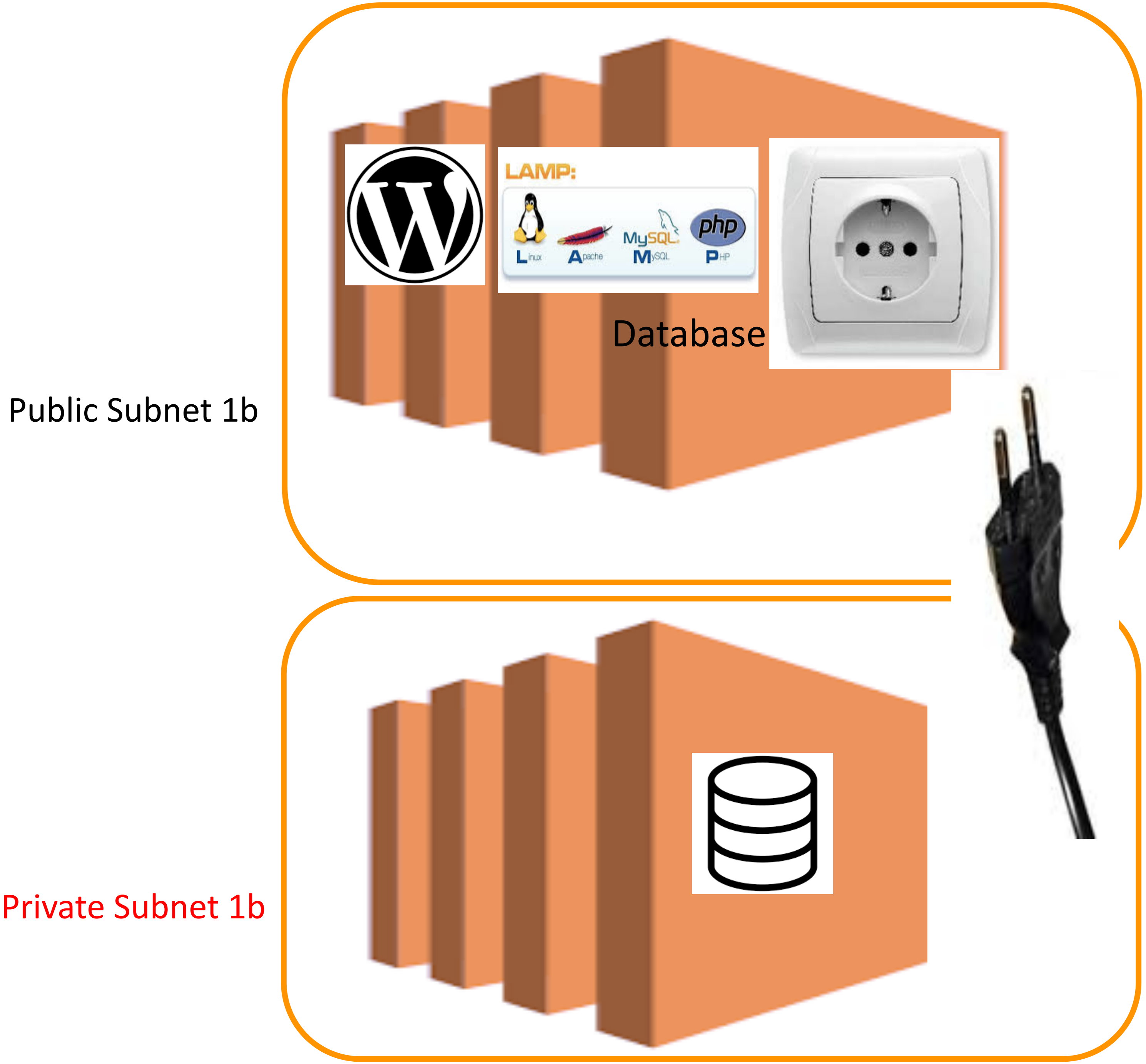
1- 0236-7543-33-33

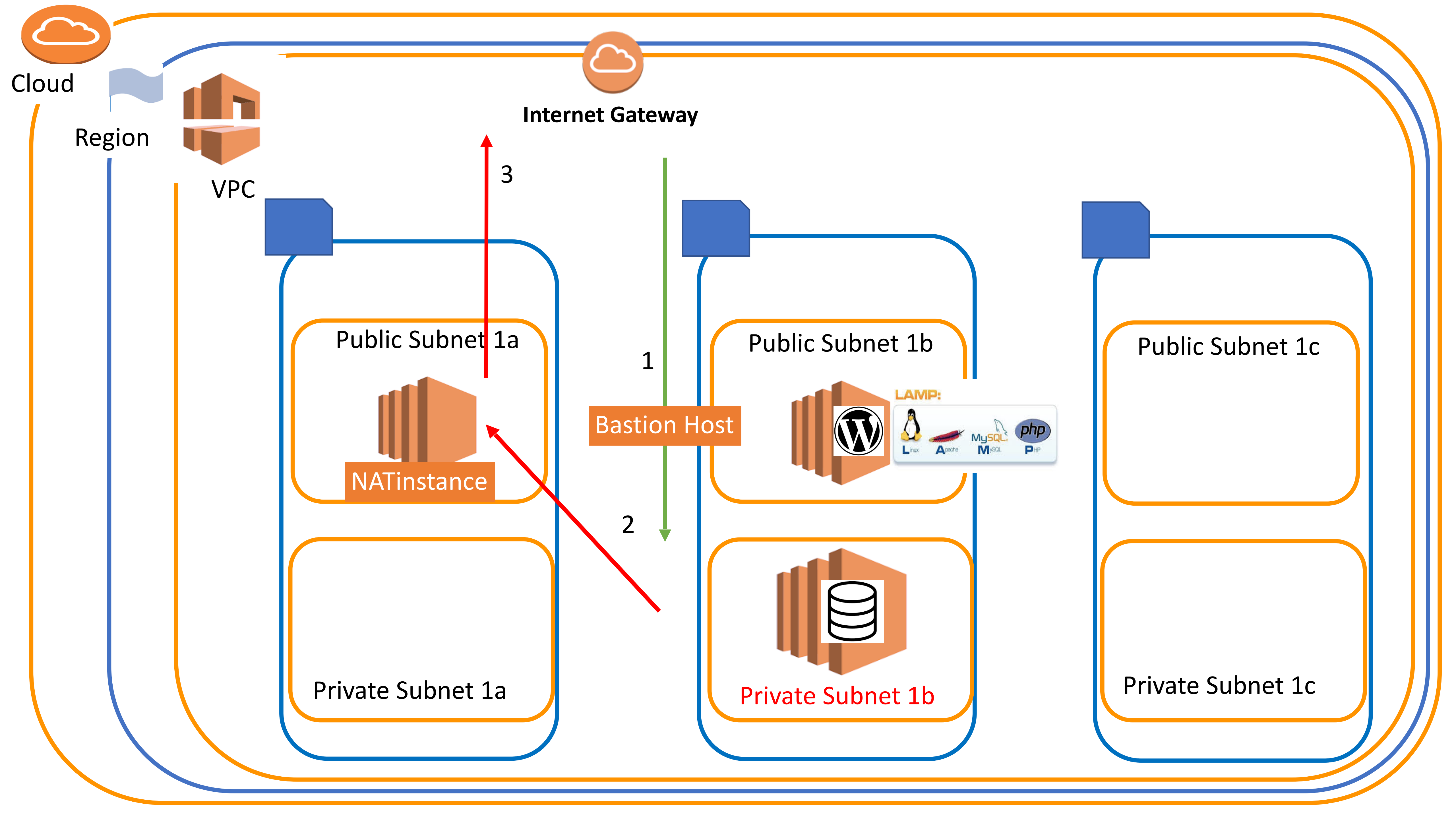
2- 20

5- Associate DATABASE



Associate DATABASE




Cloud
Region
VPC
Internet Gateway
3
1
2
Public Subnet 1a
NATinstance
Private Subnet 1a
Bastion Host
Public Subnet 1b
LAMP:
Linux
Apache
MySQL
PHP
Private Subnet 1b
Public Subnet 1c
Private Subnet 1c

Conclusion

Nat gateway-Nat instance

Change Route table of Private Subnet

Helps Private instance to install software package*

Nat instance/gatway = Unique instance

*Sec grup : Must be SSH, HTTP >>>>0.0.0.0/0

Bastion Host

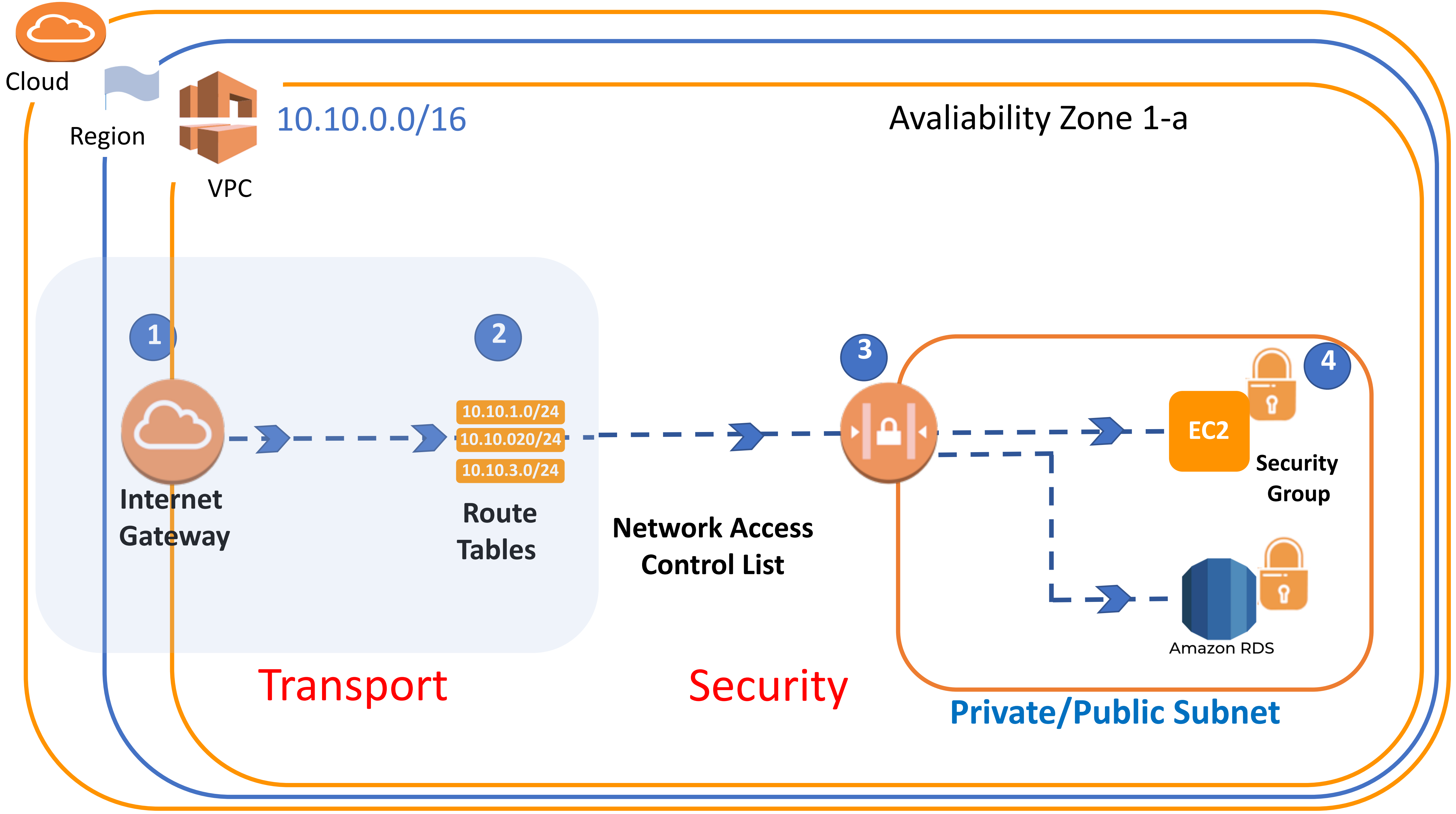
Change Sec. Group

Helps Public Instance to connect Pirvate instance

Bastion Host = Ordinary instance in public Subnet

NACL

(Network Access List)



Cloud

Region

VPC

10.10.0.0/16

Avaliability Zone 1-a

1

2

3

4

Internet Gateway

10.10.1.0/24

10.10.020/24

10.10.3.0/24

Route Tables

Network Access Control List

EC2

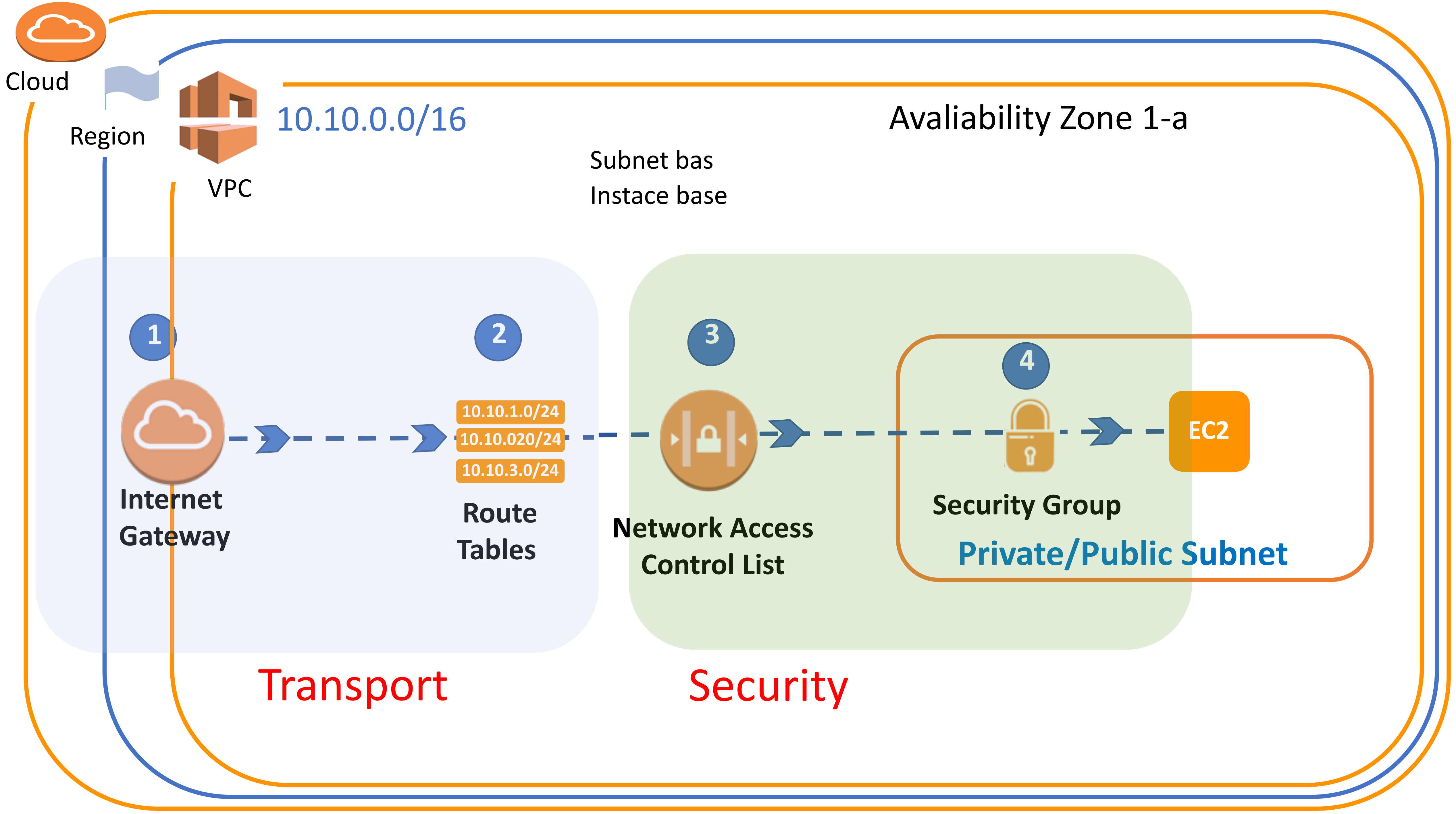
Security Group

Amazon RDS

Transport

Security

Private/Public Subnet



Cloud

Region

VPC

10.10.0.0/16

Avaliability Zone 1-a

Subnet bas

Instace base

1

Internet Gateway

2

10.10.1.0/24

10.10.020/24

10.10.3.0/24

Route Tables

3

Network Access Control List

4

Security Group

EC2

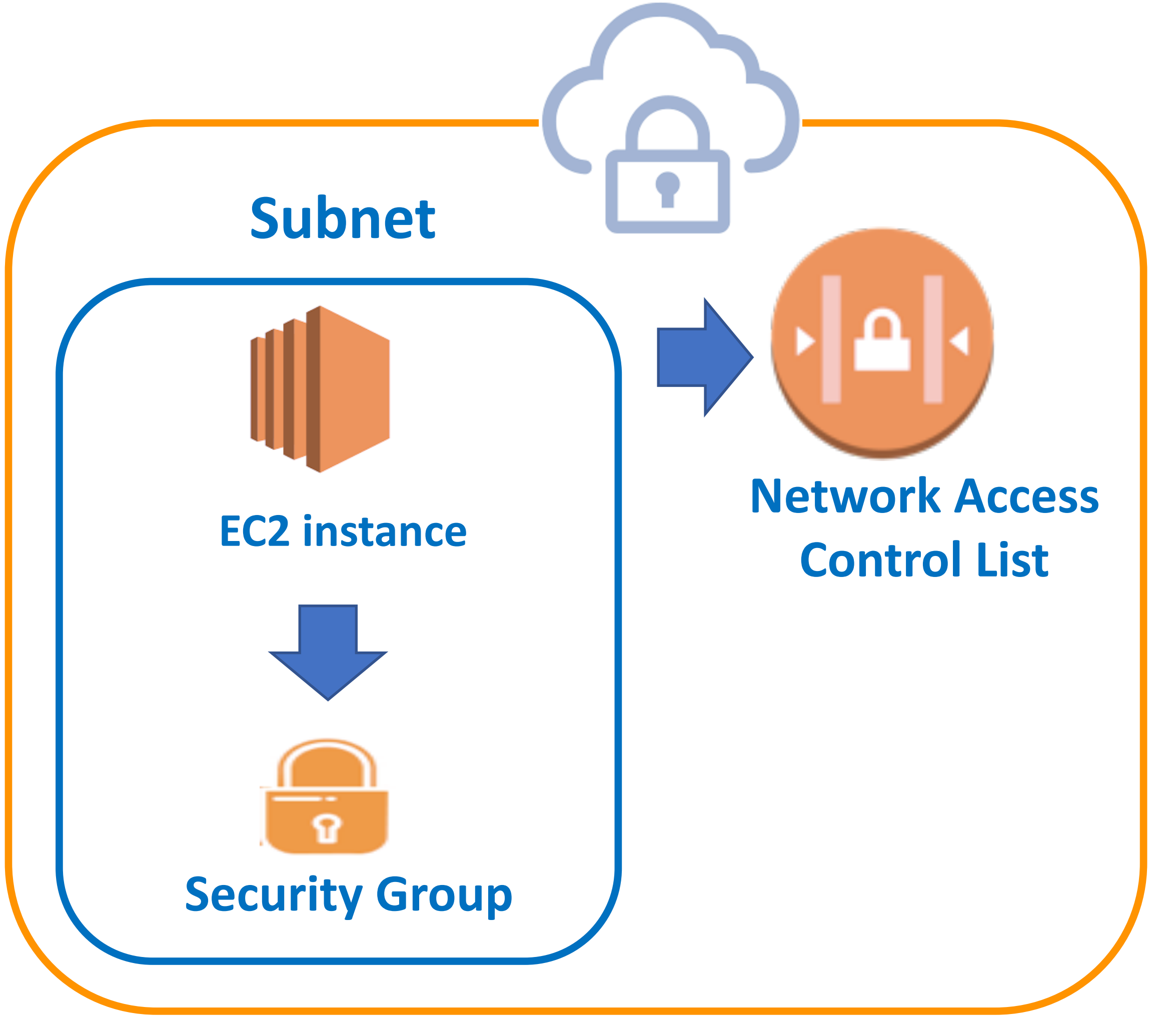
Private/Public Subnet

Transport

Security

Subnet obeys the NACL rules

EC2 obeys NACL and Sec. Group



(Statefull) Security Group inbound

Type	Protocol	Port Range	Source
HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32

ALLOW Only

Network ACL inbound (Stateless)

Rule	Type	Protocol	Port Range	Source	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

(Stateless) Network ACL outbound

Rule	Type	Protocol	Port Range	Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	Custom TCP	TCP(6)	32768 -65535	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

User

PC IP: 7.8.9.10/32

Connection Request	
No	Type-Port
1	SSH-22
2	HTTP-80
3	All ICMP-IPv4 -All
4	HTTPS-443
5	Msql/Auro. 3306

EC2

Security Group inbound

Type	Protocol	Port Range	Source
HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32

✓

Subnet

Network ACL in/outbound

Rule	Type	Protocol	Port Range	Source/ Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

User

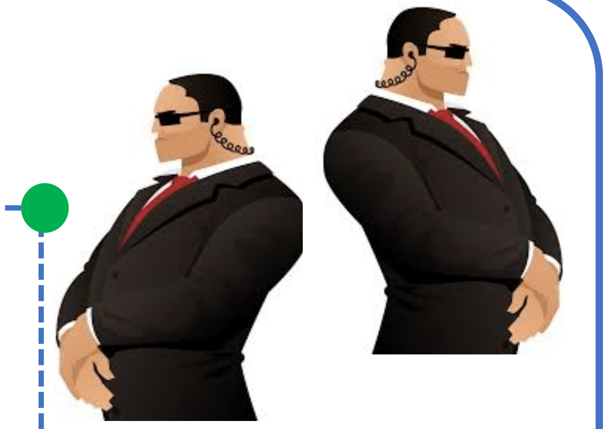
User IP: 7.8.9.10/32

Connection Request	
No	Type-Port
1	SSH-22
2	HTTP-80
3	All ICMP-IPv4 -All
4	HTTPS-443
5	Msql/Auro. 3306

Security Group inbound

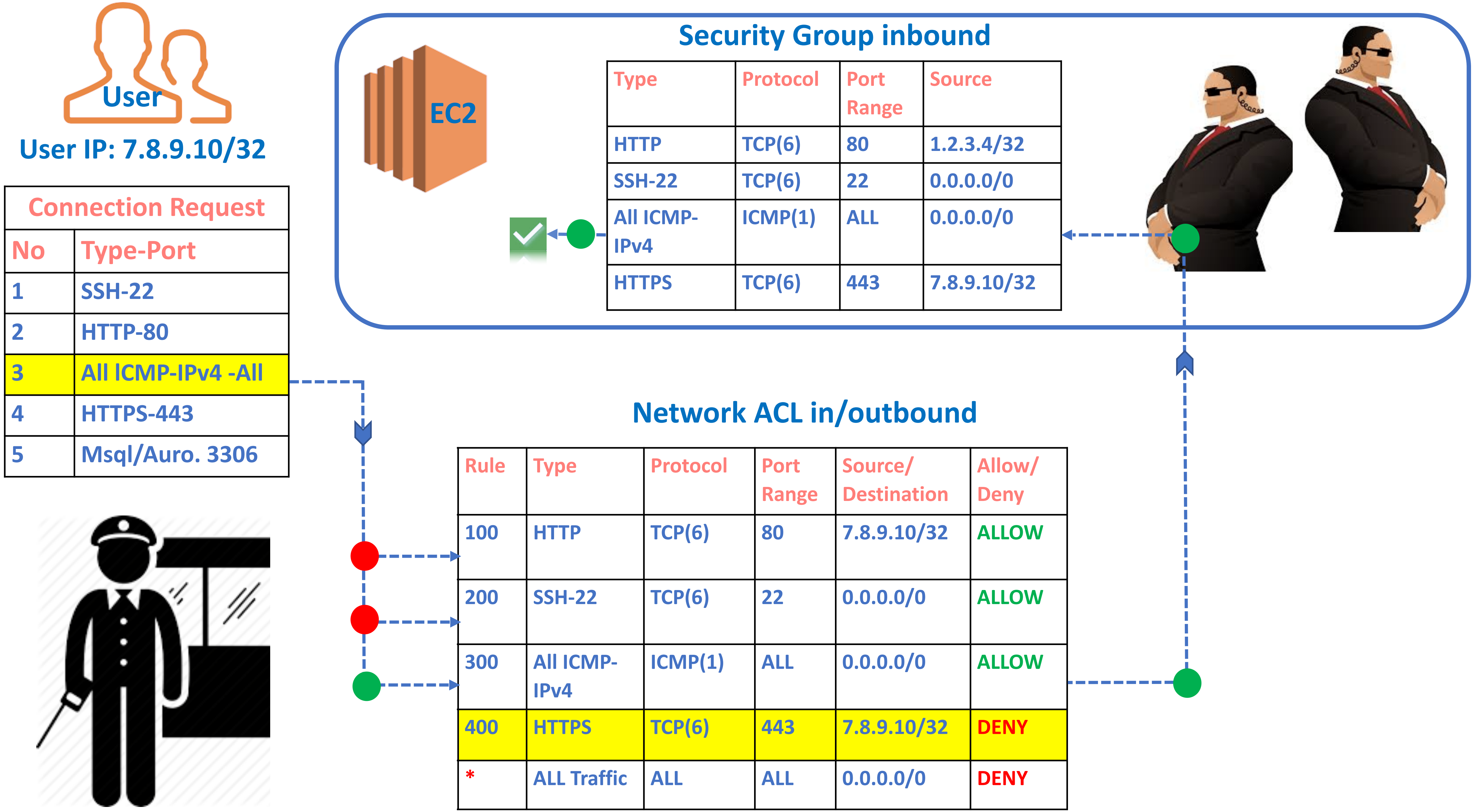
EC2

Type	Protocol	Port Range	Source
HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32



Network ACL in/outbound

Rule	Type	Protocol	Port Range	Source/ Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY



User IP: 7.8.9.10/32

Connection Request	
No	Type-Port
1	SSH-22
2	HTTP-80
3	All ICMP-IPv4 -All
4	HTTPS-443
5	Msql/Auro. 3306

Security Group inbound

Type	Protocol	Port Range	Source
HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32

Network ACL in/outbound

Rule	Type	Protocol	Port Range	Source/ Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

User

User IP: 7.8.9.10/32

Connection Request	
No	Type-Port
1	SSH-22
2	HTTP-80
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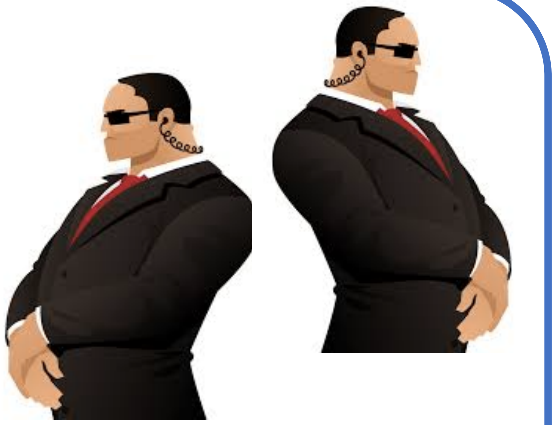
EC2

Security Group inbound

Type	Protocol	Port Range	Source
HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32



Network ACL in/outbound

Rule	Type	Protocol	Port Range	Source/ Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

User

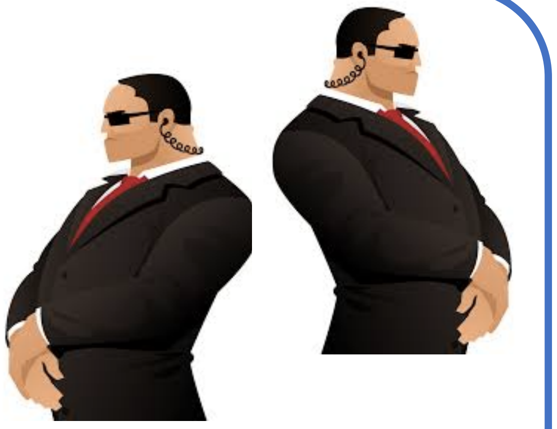
User IP: 7.8.9.10/32

Connection Request	
No	Type-Port
1	SSH-22
2	HTTP-80
3	All ICMP-IPv4 -All
4	HTTPS-443
5	Msql/Auro. 3306

Security Group inbound

EC2

Type	Protocol	Port Range	Source
HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32



Network ACL in/outbound

Rule	Type	Protocol	Port Range	Source/ Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

2768 -65535

NACLs are stateless. This means that you are required to have a rule for inbound AND outbound traffic. So, if you want to allow your EC2 instance to serve HTTP traffic, you will need to allow port 80 inbound and ports 1024 – 65535 outbound. But where 1024 – 65535 came from.

The ports 1024 – 65535 are called the “ephemeral ports”.

These ports are randomly selected to allow return traffic for a request. So, if a request comes to the server on port 80, the request also specifies a random port between 1024 – 65535 for the return traffic.

Ephemeral portlar ise bilgisayarın istemci rolü ile yer aldığı durumlarda kullanılmaktadır.

User

PC IP: 7.8.9.10/32

Connection Request	
No	Type-Port
1	SSH-22
2	HTTP-80
3	All ICMP-IPv4 -All
4	HTTPS-443
5	Msql/Auro. 3306

EC2

Security Group inbound

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HTTP	TCP(6)	80	1.2.3.4/32
SSH-22	TCP(6)	22	0.0.0.0/0
All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0
HTTPS	TCP(6)	443	7.8.9.10/32

Subnet

Network ACL in/outbound

Rule	Type	Protocol	Port Range	Source/ Destination	Allow/ Deny
100	HTTP	TCP(6)	80	7.8.9.10/32	ALLOW
200	SSH-22	TCP(6)	22	0.0.0.0/0	ALLOW
300	All ICMP-IPv4	ICMP(1)	ALL	0.0.0.0/0	ALLOW
400	HTTPS	TCP(6)	443	7.8.9.10/32	DENY
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY