

LAB: Create 3 VPCs and Load Balance between the VPCs

1. Create 3 VPCs

- VPC1: 10.0.0.0/16
- VPC2: 192.168.0.0/16
- VPC3: 172.0.0.0/16

Create VPCActions

Filter by tags and attributes or search by keyword

<<

<

1 to 4 of 4

>

>>

<input type="checkbox"/>	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP options set	Main Route
<input type="checkbox"/>	Default VPC	vpc-54da682e	available	172.31.0.0/16	-	dopt-601e411b	rtb-58625b2
<input type="checkbox"/>	VPC1	vpc-065f6be525edd3d87	available	10.0.0.0/16	-	dopt-601e411b	rtb-0859c1e
<input type="checkbox"/>	VPC2	vpc-0d8897b1a36776f06	available	192.168.0.0/16	-	dopt-601e411b	rtb-047268a
<input type="checkbox"/>	VPC3	vpc-0aa63216988c902d7	available	172.16.0.0/16	-	dopt-601e411b	rtb-0f79cd6

2. Create 2 Subnets in each VPC

(Note: Create each subnet in a different Availability Zone)

01. VPC1

- subnetA_VPC1: 10.0.0.0/20
- subnetB_VPC1: 10.0.16.0/20

02. VPC2

- subnetA_VPC2: 192.168.0.0/20
- subnetB_VPC2: 192.168.16.0/20

03. VPC3

- subnetA_VPC3: 172.16.0.0/20
- subnetB_VPC3: 172.16.16.0/20

Create subnetActions

Default subnet : NoAdd filter

1 to 6 of 6

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	Available IPv4
<input type="checkbox"/>	subnetA_VPC1	subnet-05990b9abec7c75f8	available	vpc-065f6be525edd3d87 VPC1	10.0.0.0/20	4091
<input type="checkbox"/>	subnetA_VPC2	subnet-008632b52b59bfbf7	available	vpc-0d8897b1a36776f06 VPC2	192.168.16.0/...	4091
<input type="checkbox"/>	subnetA_VPC3	subnet-0d0eb4f4884a2d66c	available	vpc-0aa63216988c902d7 VPC3	172.16.0.0/20	4091
<input type="checkbox"/>	subnetB_VPC1	subnet-0ab010c76f2e6eb8d	available	vpc-065f6be525edd3d87 VPC1	10.0.16.0/20	4091
<input type="checkbox"/>	subnetB_VPC2	subnet-0bc9678b453237e5f	available	vpc-0d8897b1a36776f06 VPC2	192.168.0.0/20	4091
<input type="checkbox"/>	subnetB_VPC3	subnet-06d7578a6f089d6ba	available	vpc-0aa63216988c902d7 VPC3	172.16.16.0/20	4091

3. Create Internet Gateways for each VPC and attach them to respective VPCs

- IGW_VPC1
- IGW_VPC2
- IGW_VPC3

Create internet gateway Actions

Filter by tags and attributes or search by keyword

	Name	ID	State	VPC	Owner
<input type="checkbox"/>	IGW_VPC1	igw-07731e5b0de...	attached	vpc-065f6be525e...	696866689030
<input type="checkbox"/>	IGW_VPC2	igw-0169f86bad7e...	attached	vpc-0d8897b1a36...	696866689030
<input type="checkbox"/>	IGW_VPC3	igw-071322393fa8...	attached	vpc-0aa63216988...	696866689030
<input type="checkbox"/>	defaultIGW	igw-184fa963	attached	vpc-54da682e D...	696866689030

4. Create 3 Peering Connections

- VPC1_VPC2
- VPC2_VPC3
- VPC3_VPC1

Create Peering Connection Actions

Filter by tags and attributes or search by keyword

	Name	Peering Connecti	Status	Requester VPC	Accepter VPC	Requester CIDRs	Accepter CIDRs
<input type="checkbox"/>	VPC1_VPC2	pcx-0aef997adf1f8...	Active	vpc-065f6be525ed...	vpc-0d8897b1a36...	10.0.0.0/16	192.168.0.0/16
<input type="checkbox"/>	VPC2_VPC3	pcx-0e7f541b6436...	Active	vpc-0d8897b1a36...	vpc-0aa63216988...	192.168.0.0/16	172.16.0.0/16
<input type="checkbox"/>	VPC3_VPC1	pcx-0fd46121fd47...	Active	vpc-0aa63216988...	vpc-065f6be525ed...	172.16.0.0/16	10.0.0.0/16

5.

A. There will be 3 Route Tables that will be created automatically created by default as the VPCs are created. Rename them as follows:

- LocalRT_VPC1
- LocalRT_VPC2
- LocalRT_VPC3

Create route table Actions

Filter by tags and attributes or search by keyword

	Name	Route Table ID	Explicitly Associated with	Main	VPC ID	Owner
<input type="checkbox"/>	LocalRT_VPC1	rtb-0859c1ef9869471de	-	Yes	vpc-065f6be525edd3d87 ...	696866689030
<input type="checkbox"/>	LocalRT_VPC2	rtb-047268a88c52a1191	-	Yes	vpc-0d8897b1a36776f06 ...	696866689030
<input type="checkbox"/>	LocalRT_VPC3	rtb-0f79cd6c16dc26fb2	-	Yes	vpc-0aa63216988c902d7 ...	696866689030
<input type="checkbox"/>	Default_RT	rtb-58625b27	-	Yes	vpc-54da682e Default V...	696866689030

These are the Local routes i.e. connections within the respective VPCs only.

B. Create 3 Route Tables separately.

[Create route table](#) [Actions](#)

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<input type="checkbox"/>	Name	Route Table ID	Explicitly Associated with	Main	VPC ID
<input type="checkbox"/>	Default_RT	rtb-58625b27	-	Yes	vpc-54da682e Default V...
<input checked="" type="checkbox"/>	InternetRT_VPC1	rtb-07ebcd58f08d0b7b6	-	No	vpc-065f6be525edd3d87 ...
<input type="checkbox"/>	InternetRT_VPC2	rtb-055ac02ab74f9b6c7	-	No	vpc-0d8897b1a36776f06 ...
<input type="checkbox"/>	InternetRT_VPC3	rtb-0aafdfcfe60f13150	-	No	vpc-0aa63216988c902d7 ...
<input type="checkbox"/>	LocalRT_VPC1	rtb-0859c1ef9869471de	-	Yes	vpc-065f6be525edd3d87 ...
<input type="checkbox"/>	LocalRT_VPC2	rtb-047268a88c52a1191	-	Yes	vpc-0d8897b1a36776f06 ...
<input type="checkbox"/>	LocalRT_VPC3	rtb-0f79cd6c16dc26fb2	-	Yes	vpc-0aa63216988c902d7 ...

Route Table: rtb-07ebcd58f08d0b7b6

[Summary](#) [Routes](#) [Subnet Associations](#) [Route Propagation](#) [Tags](#)

[Edit routes](#)

View [All routes](#)

Then add the following routes for each as follows:

- **For InternetRT_VPC1**

- ☐ For the Internet Gateway: 0.0.0.0/0
- ☐ For peering b/w VPC1 and VPC2: 192.168.0.0/16
- ☐ For peering b/w VPC1 and VPC3: 172.16.0.0/16

[Route Tables](#) > [Edit routes](#)

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
<input type="text" value="0.0.0.0"/>	<input type="text" value="igw-07731e5b0dee64ca3"/>		No <input type="button" value="X"/>
<input type="text" value="192.168.0.0/16"/>	<input type="text" value="pcx-0aef997adf1f8ffc4"/>		No <input type="button" value="X"/>
<input type="text" value="172.16.0.0/16"/>	<input type="text" value="pcx-0fd46121fd4749db3"/>		No <input type="button" value="X"/>

[Add route](#)

- **For InternetRT_VPC2**

- ☐ For the Internet Gateway: 0.0.0.0/0
- ☐ For peering b/w VPC2 and VPC1: 10.0.0.0/16
- ☐ For peering b/w VPC2 and VPC3: 172.16.0.0/16

Destination	Target	Status	Propagated	
192.168.0.0/16	local	active	No	
0.0.0.0/0	igw-0169f86bad7e9f203	active	No	✕
10.0.0.0/16	pcx-0aef997adf1f8ffc4	active	No	✕
172.16.0.0/16	pcx-0e7f541b64368a682	active	No	✕

Add route

- **For InternetRT_VPC3**

- ❑ For the Internet Gateway: 0.0.0.0/0
- ❑ For peering b/w VPC3 and VPC1: 10.0.0.0/16
- ❑ For peering b/w VPC3 and VPC2: 192.168.0.0/16

Destination	Target	Status	Propagated	
172.16.0.0/16	local	active	No	
0.0.0.0/0	igw-071322393fa819feb		No	✕
10.0.0.0/16	pcx-0fd46121fd4749db3		No	✕
192.168.0.0/16	pcx-0e7f541b64368a682		No	✕

Add route

6. Associate the Subnets having public connection to the newly created Route Tables as follows:

- **For InternetRT_VPC1**

Create route table

Actions

Filter by tags and attributes or search by keyword

1 to 7 of 7

<input type="checkbox"/>	Name	Route Table ID	Explicitly Associated with	Main	VPC ID	Owner
<input type="checkbox"/>	Default_RT	rtb-58625b27	-	Yes	vpc-54da682e Default V...	69680
<input checked="" type="checkbox"/>	InternetRT_VPC1	rtb-07ebcd58f08d0b7b6	subnet-05990b9abec7c75f8	No	vpc-065f6be525edd3d87 ...	69686
<input type="checkbox"/>	InternetRT_VPC2	rtb-055ac02ab74f9b6c7	subnet-008632b52b59bfbf7	No	vpc-0d8897b1a36776f06 ...	69686
<input type="checkbox"/>	InternetRT_VPC3	rtb-0aafdfcfe60f13150	subnet-0d0eb4f4884a2d66c	No	vpc-0aa63216988c902d7 ...	69688

Route Table: rtb-07ebcd58f08d0b7b6

Summary

Routes

Subnet Associations

Route Propagation

Tags

Edit subnet associations

1 to 1 of 1

Subnet ID	IPv4 CIDR	IPv6 CIDR
subnet-05990b9abec7c75f8 subnetA_VPC1	10.0.0.0/20	-

- **For InternetRT_VPC2**

Summary	Routes	Subnet Associations	Route Propagation	Tags
Edit subnet associations				
Subnet ID		IPv4 CIDR	IPv6 CIDR	
subnet-008632b52b59bfbf7 subnetA_VPC2		192.168.16.0/20	-	

- **For InternetRT_VPC3**

Summary	Routes	Subnet Associations	Route Propagation	Tags
Edit subnet associations				
Subnet ID		IPv4 CIDR	IPv6 CIDR	
subnet-0d0eb4f4884a2d66c subnetA_VPC3		172.16.0.0/20	-	

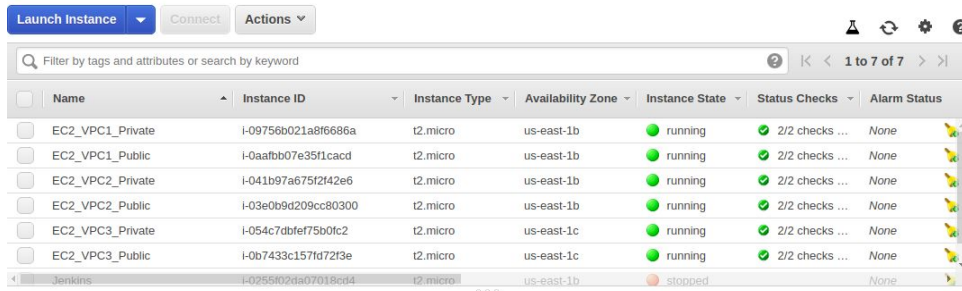
7. Create 2 Instances for each VPC as follows:

- EC2_VPC1_Private
 - ❖ subnetB_VPC1
- EC2_VPC1_Public
 - ❖ subnetA_VPC1
- EC2_VPC2_Private
 - ❖ subnetB_VPC2
- EC2_VPC2_Public
 - ❖ subnetA_VPC2
- EC2_VPC3_Private
 - ❖ subnetB_VPC3
- EC2_VPC3_Public
 - ❖ subnetA_VPC3

Testing

8. SSH into **EC1_VPC1_Public**

- Ping google.com (there should be reply)
- SSH into **EC2_VPC1_Private** instance from the EC1_VPC1_Public
 1. create **mykey.pem** file in **EC1_VPC1_Public** instance
 - vi mykey.pem
 - Copy the entire contents of the Security Key file that is saved on the local system and paste it in the mykey.pem file and save it :**wq**
 2. chmod 700 mykey.pem
 3. ssh -i mykey.pem ec2-user@private_ip_of_EC2_VPC1_Private_Instance
 4. Ping google.com from this instance (there should be no reply)
 5. Similarly login to EC2_VPC2_Private Instance from EC2_VPC1_Private Instance and so on to check one by one.



	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
<input type="checkbox"/>	EC2_VPC1_Private	i-09756b021a8f6686a	t2.micro	us-east-1b	running	2/2 checks ...	None
<input type="checkbox"/>	EC2_VPC1_Public	i-0aaafb07e3511cacd	t2.micro	us-east-1b	running	2/2 checks ...	None
<input type="checkbox"/>	EC2_VPC2_Private	i-041b97a675f2f42e6	t2.micro	us-east-1b	running	2/2 checks ...	None
<input type="checkbox"/>	EC2_VPC2_Public	i-03e0b9d209cc80300	t2.micro	us-east-1b	running	2/2 checks ...	None
<input type="checkbox"/>	EC2_VPC3_Private	i-054c7dbfe75b0fc2	t2.micro	us-east-1c	running	2/2 checks ...	None
<input type="checkbox"/>	EC2_VPC3_Public	i-0b7433c157fd72f3e	t2.micro	us-east-1c	running	2/2 checks ...	None
<input type="checkbox"/>	Jenkins	i-0255f02da07018cfd	t2.micro	us-east-1b	stopped		None

LOAD BALANCER

Create Load Balancer

Actions ▾

Filter by tags and attributes or search by keyword

Name

▲

DNS name

You do not hav

Select load balancer type

Elastic Load Balancing supports three types of load balancers: Application Load Balancers, Network Load Balancers (new), and Classic Load Balancers. Choose the load balancer type that meets your needs. [Learn more about which load balancer is right for you](#)

Application Load Balancer

HTTP
HTTPS

Create

Choose an Application Load Balancer when you need a flexible feature set for your web applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.

Learn more >

Network Load Balancer

TCP
TLS

Create

Choose a Network Load Balancer when you need ultra-high performance, the ability to terminate TLS connections at scale, centralize certificate deployment, and static IP addresses for your application. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.

Learn more >

Classic Load Balancer

PREVIOUS GENERATION
for HTTP, HTTPS, and TCP

Create

Choose a Classic Load Balancer when you have an existing application running in the EC2-Classical network.

Learn more >

Cancel

Step 1: Configure Load Balancer

Basic Configuration

To configure your load balancer, provide a name, select a scheme, specify one or more listeners, and select a network. The default configuration is a network with a listener that receives HTTP traffic on port 80.

Name ⓘ

Scheme ⓘ ☒ internet-facing ☐ internal

IP address type ⓘ

Listeners

A listener is a process that checks for connection requests, using the protocol and port that you configured.

Load Balancer Protocol	Load Balancer Port
<input type="text" value="HTTP"/>	<input type="text" value="80"/>
<input type="button" value="Add listener"/>	

Select the user created VPC (in this case VPC1)

Step 1: Configure Load Balancer

Specify the Availability Zones to enable for your load balancer. The load balancer routes traffic to the targets in these Availability Zones only. You can specify only one subnet per Availability Zone. You must specify subnets from at least two Availability Zones to increase the availability of your load balancer.

VPC ⓘ

Availability Zone	Subnet ID	Subnet IPv4 CIDR	Name	
<input checked="" type="checkbox"/> us-east-1b	subnet-05990b9abec7c75f8	10.0.0.0/20	Public_subnetA_VPC1	Change subnet...
<input checked="" type="checkbox"/> us-east-1f	subnet-01403ade5431fd56a	10.0.32.0/20	Public_subnetC_VPC1	

At least two subnets must be specified

Step 3: Configure Security Groups

A security group is a set of firewall rules that control the traffic to your load balancer. On this page, you can add rules to allow specific traffic to reach your load balancer. First, decide whether to create a new security group or select an existing one.

Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name:

Description:

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	
<input type="text" value="HTTP"/>	<input type="text" value="TCP"/>	<input type="text" value="80"/>	<input type="text" value="Custom 0.0.0.0, ::/0"/>	<input type="button" value="X"/>
<input type="text" value="All TCP"/>	<input type="text" value="TCP"/>	<input type="text" value="0 - 65535"/>	<input type="text" value="Custom 0.0.0.0"/>	<input type="button" value="X"/>
<input type="text" value="HTTP"/>	<input type="text" value="TCP"/>	<input type="text" value="80"/>	<input type="text" value="Custom 0.0.0.0, ::/0"/>	<input type="button" value="X"/>
<input type="text" value="SSH"/>	<input type="text" value="TCP"/>	<input type="text" value="22"/>	<input type="text" value="Custom 0.0.0.0"/>	<input type="button" value="X"/>
<input type="button" value="Add Rule"/>				

Select Target type as IP

1. Configure Load Balancer

2. Configure Security Settings

3. Configure Security Groups

4. Configure Routing

5. Register Targets

6. Review

Step 4: Configure Routing

Your load balancer routes requests to the targets in this target group using the protocol and port that you specify, and performs health checks on the targets. Each target group can be associated with only one load balancer.

Target group

Target group ⓘ

Name ⓘ

Target type

☐ Instance

☒ IP

☐ Lambda function

Protocol ⓘ

Port ⓘ

Health checks

Protocol ⓘ

Path ⓘ

Go to Register Targets and add the private ips of respective instances.

- 192.168.31.36
- 10.0.36.210
- 10.0.14.66
- 172.16.11.91

1. Configure Load Balancer

2. Configure Security Settings

3. Configure Security Groups

4. Configure Routing

5. Register Targets

6. Review

Step 5: Register Targets

vpcTarget (target group)

Specify one or more IP addresses to register as targets

Network ⓘ	Availability Zone ⓘ	IP (allowed ranges)	Port ⓘ	
<input type="text" value="Other private IP address"/>	<input type="text" value="all"/>	<input type="text"/>	<input type="text" value="80"/>	<input type="button" value="Add to list"/>

To be registered

4 total IP addresses.

172.16.11.91	: 80	all	instance (i-0b7433c157fd72f3e)	<input type="button" value="X"/>
192.168.31.36	: 80	all	instance (i-03e0b9d209cc80300)	<input type="button" value="X"/>
10.0.14.66	: 80	us-east-1b	instance (i-0aafb07e35f1cacd)	<input type="button" value="X"/>
10.0.36.210	: 80	us-east-1f	instance (i-088b9b2c5bea925e0)	<input type="button" value="X"/>

Review and click on create

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

Step 6: Review

Please review the load balancer details before continuing

▼ Load balancer

Name

vpclB

Scheme

internet-facing

Listeners

Port:80 - Protocol:HTTP

IP address type

ipv4

VPC

vpc-065f6be525edd3d87 (VPC1)

Subnets

subnet-05990b9abec7c75f8 (Public_subnetA_VPC1), subnet-01403ade5431fd56a (Public_subnetC_VPC1)

Tags

Edit

▼ Security groups

Security groups

load-balancer

Edit

▼ Routing

Target group

New target group

Target group name

vpclBTarget

Port

80

Target type

ip

Protocol

HTTP

Edit

Cancel

Previous

Create

Load Balancer Creation Status

✔

Successfully created load balancer
Load balancer **vpclB** was successfully created.
Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic, and for the targets to complete the registration process and pass the initial health checks.

Close

Go to Listeners Tab → Click on view/edit rules

Create Load Balancer

Actions ▼

Filter by tags and attributes or search by keyword

	Name	DNS name	Status
<input checked="" type="checkbox"/>	vpclB	vpclB-1427805980.us-east-1.elb.amazonaws.com	provisioning

Load balancer: **vpclB**

Description

Listeners

Monitoring

Integrated services

Tags

A listener checks for connection requests using its configured protocol and port, and the load balancer uses the listener rules to route traffic to the targets. You can add, remove, or update listeners and listener rules.

Add the following rules

<

Rules

+

⇅

-

vpcLB | HTTP:80 ▾

To edit, select a mode above.

vpcLB | HTTP:80 (3 rules)

1	arn...e0c5c ▾	IF ✓ Path is *default*	THEN Return fixed response 503 (more...)
2	arn...2d54a ▾	IF ✓ Path is *shopping*	THEN Redirect to http://www.flipkart.com:80/ ? Status code: HTTP_301
last	HTTP 80: default action <i>This rule cannot be moved or deleted</i>	IF ✓ Requests otherwise not routed	THEN Forward to vpcTarget

TESTING

- Install httpd service in all the instances
→ `yum install httpd`
- `cd /var/www/html`
- Create an html page in every instance
→ `vi index.html`
- Start the httpd service
→ `service httpd start`
- Copy DNS of Load Balancer and check in browser if its working or not