

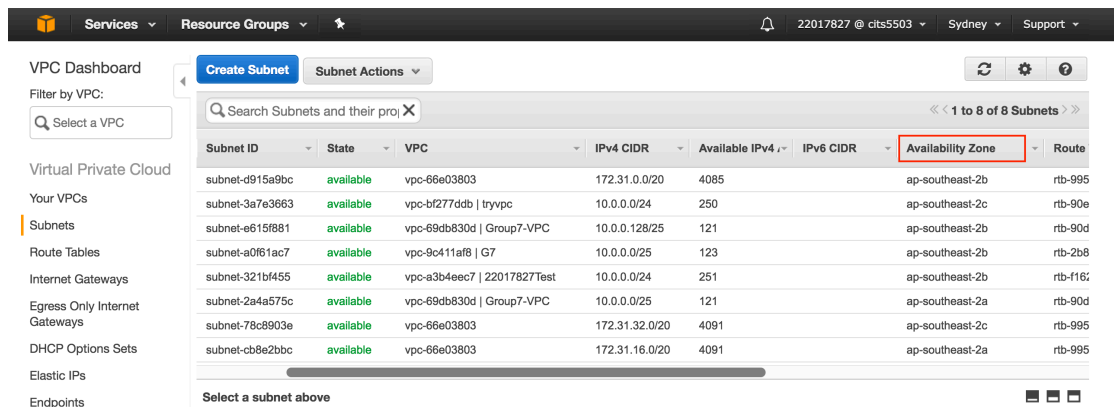
## Topic: Create a load balancer

### Part A: Create VPC and subnet

- Open the Amazon VPC console at <https://console.aws.amazon.com/vpc/>.
- In the dashboard, choose **Start VPC Wizard**.
- Select the first option, **VPC with a Single Public Subnet**, and then choose **Select**.
- For **VPC name** and **Subnet name**, you can name your VPC and subnet to help you to identify them later in the console. You can specify your own IPv4 CIDR block range for the VPC and subnet, or you can leave the default values (10.0.0.0/16 and 10.0.0.0/24 respectively).

**Question: If there is a CIDR block 10.10.1.32/27, Does 10.10.1.44 match this CIDR block? How about 10.10.1.90? Please give the answer and explain in the lab report.**

- You can leave the rest of the default settings, and choose **Create VPC**.
- Go back to VPC Dashboard, click **Subnets**.
- Click **Create Subnet**.
- Name your subnet, select the VPC you have created one. Choose the same availability zone with the subnet you have created (figure1). Enter a valid IPv4 CIDR Block.



Subnet ID	State	VPC	IPv4 CIDR	Available IPv4	IPv6 CIDR	Availability Zone	Route
subnet-d915a9bc	available	vpc-66e03803	172.31.0.0/20	4085		ap-southeast-2b	rtb-995
subnet-3a7e3663	available	vpc-bf277ddb   tryvpc	10.0.0.0/24	250		ap-southeast-2c	rtb-90e
subnet-e615f881	available	vpc-69db830d   Group7-VPC	10.0.0.128/25	121		ap-southeast-2b	rtb-90d
subnet-a0f61ac7	available	vpc-9c411af8   G7	10.0.0.0/25	123		ap-southeast-2b	rtb-2b8
subnet-321bf455	available	vpc-a3b4eec7   22017827Test	10.0.0.0/24	251		ap-southeast-2b	rtb-f16
subnet-2a4a575c	available	vpc-69db830d   Group7-VPC	10.0.0.0/25	121		ap-southeast-2a	rtb-90d
subnet-78c8903e	available	vpc-66e03803	172.31.32.0/20	4091		ap-southeast-2c	rtb-995
subnet-cb8e2bbc	available	vpc-66e03803	172.31.16.0/20	4091		ap-southeast-2a	rtb-995

figure1

- Choose **Yes, Create**

### Part B: Create security group

- Open the Amazon VPC console at <https://console.aws.amazon.com/vpc/>.
- In the navigation pane, choose **Security Groups**.
- Choose **Create Security Group**.

- Provide a name and description for the security group. Select the ID of your VPC from the **VPC** menu, and then choose **Yes, Create**.
- On the **Inbound Rules** tab, choose **Edit**, and then do the following:
  1. Select **HTTP** from the **Type** list, and enter 0.0.0.0/0 in the **Source** field.
  2. Add **HTTPS** from the **Type** list, and enter 0.0.0.0/0 in the **Source** field.
  3. **Add another rule**, then select **SSH** (for Linux) or **RDP** (for Windows) from the **Type** list, and enter 0.0.0.0/0 in the **Source** field.
- Choose **Save**.

#### Part C: Launch an instance into VPC

- Open the Amazon EC2 console at <https://console.aws.amazon.com/ec2/>.
- From the dashboard, choose **Launch Instance**.
- Choose *Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-e2021d81*
- To the **Configure Instance Details** page, select the VPC that you created in Part A from the Network list, and then specify a subnet, choose the **public subset** (not the second one you created.).
- To assign a public IPv4 address now, ensure that you select **Enable** from the **Auto-assign Public IP** list.
- On the next two pages of the wizard, you can configure storage for your instance, and add tags. On the **Configure Security Group** page, select the **Select an existing security group** option, and select the security group that you created. Choose **Review and Launch**.

#### Part D: Install apache2 on your instance

- Connect to your instance
- Enter **sudo bash** in command line
- Enter **apt-get update** in command line
- After updating successfully, enter **apt-get install apache2** in command line
- Find your **Public DNS** (figure2), copy the DNS, and open it in the web browser. If successfully, Apache2 ubuntu default page will welcome you. **Screenshot this Apache2 ubuntu default page with DNS url on top.**

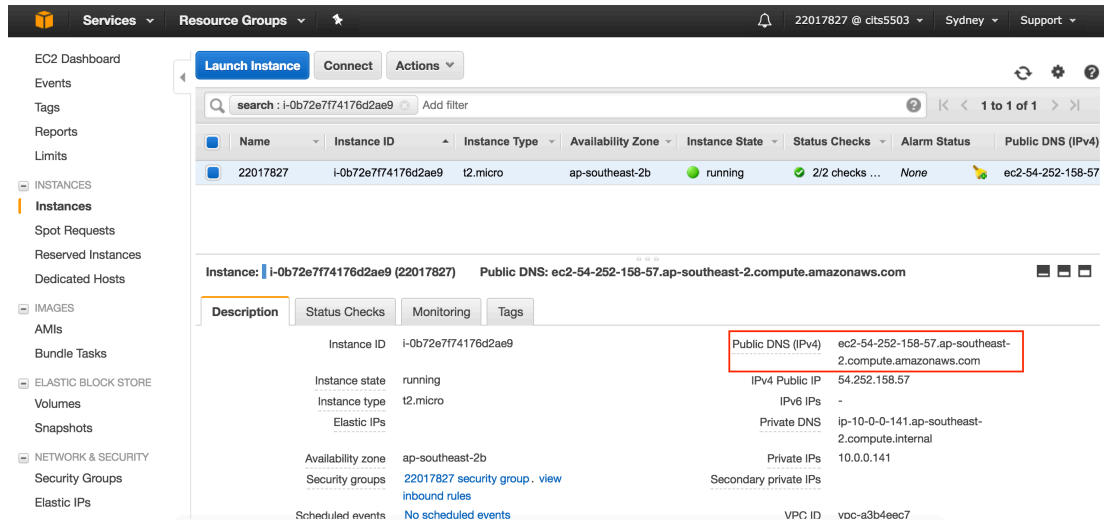


figure2

## Part E: Create a load balancer

- Go back to EC2 Dashboard, click **Load Balancers**.
- Click **Create Load Balancer**.
- Choose Classic Load Balancer, click **Create**.
- Connect it to the VPC you have created, In Selected subnets, select the public one (not the second one you created) into the Selected subnets (figure3). Click

### Next:Assign Security Groups

#### Step 1: Define Load Balancer

##### Select Subnets

You will need to select a Subnet for each Availability Zone where you wish traffic to be routed by your load balancer. If you have instances in only one Availability Zone, please select at least two Subnets in different Availability Zones to provide higher availability for your load balancer.

VPC vpc-a3b4eec7 (10.0.0.0/16) | 22017827Test

Please select at least two Subnets in different Availability Zones to provide higher availability for your load balancer.

##### Available subnets

Actions	Availability Zone	Subnet ID	Subnet CIDR	Name
	ap-southeast-2b	subnet-8319f6e4	10.0.1.0/24	22017827 subnet

##### Selected subnets

Actions	Availability Zone	Subnet ID	Subnet CIDR	Name
	ap-southeast-2b	subnet-321bf455	10.0.0.0/24	22017827 public

figure3

- Choose the security group you have created.
- In **Step4: Configure Health Check**, For Ping Path, replace the default value with a single forward slash ("/"). This tells Elastic Load Balancing to send health check queries to the default home page for your web server, such as index.html. (figure4)

**Ping Protocol** HTTP

**Ping Port** 80

**Ping Path** /

figure4

- In **Step5: Add EC2 instances**, add instance you have created.
- Then, set a tag if you want. Last, **Create**.
- Find your load balancer, check the **Instances** status (figure5). If it's OutOfService, wait until status show InService.

Filter: Search

Name	DNS name	State	VPC ID	Availability Zones	Type
rashmi-elb	rashmi-elb-1372256908.ap-s...		vpc-66e03803	ap-southeast-2b, ap-so...	clas
22017827LB	22017827LB-2045882200.a...		vpc-a3b4eec7	ap-southeast-2b	clas
Group7TCP	Group7TCP-e805cbdd8807f...	active	vpc-69db830d	ap-southeast-2a, ap-so...	netw

Load balancer: 22017827LB

Connection Draining: Enabled, 300 seconds (Edit)

Edit Instances

Instance ID	Name	Availability Zone	Status	Actions
i-0b72e7f74176d2ae9	22017827	ap-southeast-2b	OutOfService ⓘ	Remove from Load Balancer

figure5

- Go back to **Description**, find your load balancer DNS (figure6), copy the DNS, and open it in the web browser. If successfully, Apache2 ubuntu default page will welcome you. **Screenshot this Apache2 ubuntu default page with DNS url on top.**

Filter: Search

Name	DNS name	State	VPC ID	Availability Zones	Type
rashmi-elb	rashmi-elb-1372256908.ap-s...		vpc-66e03803	ap-southeast-2b, ap-so...	clas
22017827LB	22017827LB-2045882200.a...		vpc-a3b4eec7	ap-southeast-2b	clas
Group7TCP	Group7TCP-e805cbdd8807f...	active	vpc-69db830d	ap-southeast-2a, ap-so...	netw

Description Instances Health Check Listeners Monitoring Tags

Basic Configuration

Name: 22017827LB

DNS name: 22017827LB-2045882200.ap-southeast-2.elb.amazonaws.com (A Record)

Creation time: September 15, 2017 at 12:39:54 PM UTC+8

Hosted zone: Z1GM3OXH4ZPM65

Status: 1 of 1 instances in service

VPC: vpc-a3b4eec7

Scheme: internet-facing

Availability Zones: subnet-321bf455 - ap-southeast-2b

Port Configuration

figure6