

LOAD BALANCER

STEP 1: CREATE TWO LINUX INSTANCES.

INSTANCE-1 NAMED AS WEB1:

The screenshot displays the AWS Management Console interface for EC2 instances. On the left, a navigation sidebar lists various services like EC2 Dashboard, Events, Tags, Limits, and Instances. The main panel shows a list of two instances: 'web2' and 'web1'. Both are in a 'Running' state. Below the list, the details for instance 'web1' (ID: i-026188dc42e20e040) are expanded, showing its configuration, including the public IPv4 address (13.127.44.85), public IPv4 DNS (ec2-13-127-44-85.ap-south-1.compute.amazonaws.com), and private IPv4 addresses (172.31.44.107).

Name	Instance ID	Instance state	Instance type	Status check	Alarm Status	Availability zone
web2	i-0b33be47e6660ff0d	Running	t2.micro	Initializing	No alarms	ap-south-1a
web1	i-026188dc42e20e040	Running	t2.micro	Initializing	No alarms	ap-south-1a

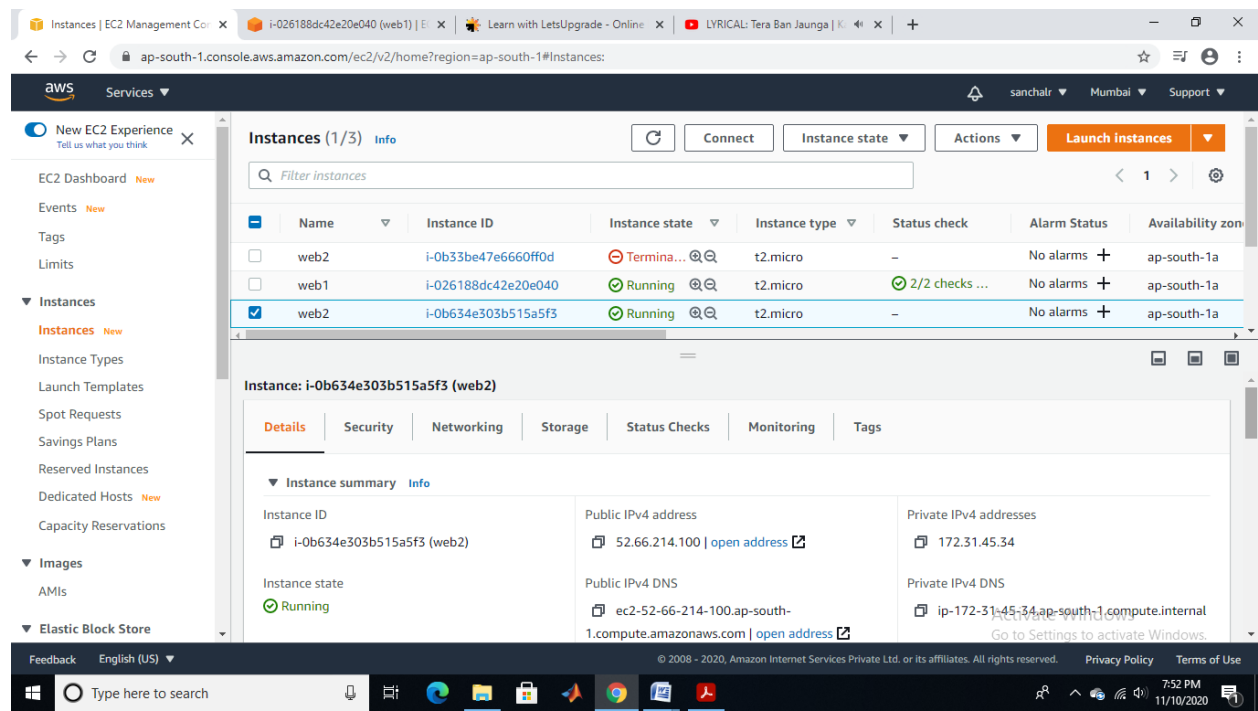
Instance: i-026188dc42e20e040 (web1)

Details | Security | Networking | Storage | Status Checks | Monitoring | Tags

Instance summary | Info

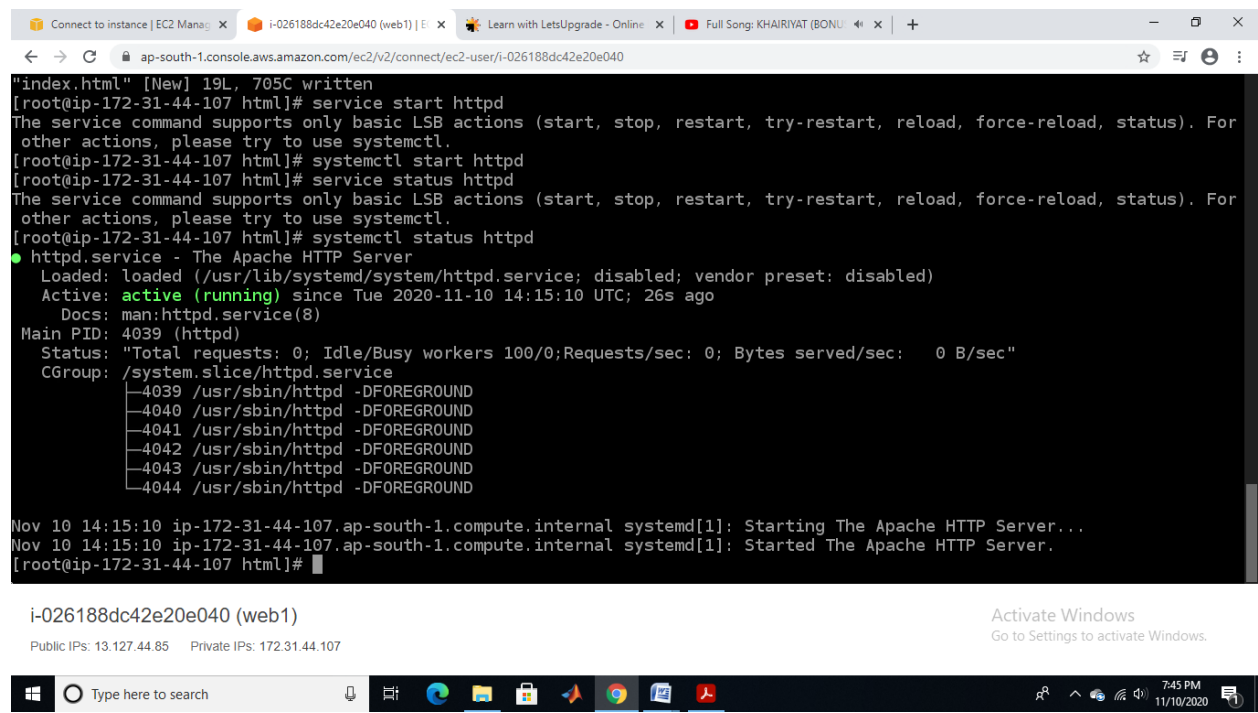
Instance ID	Public IPv4 address	Private IPv4 addresses
i-026188dc42e20e040 (web1)	13.127.44.85 open address	172.31.44.107
Instance state	Public IPv4 DNS	Private IPv4 DNS
Running	ec2-13-127-44-85.ap-south-1.compute.amazonaws.com open address	ip-172-31-44-107.ap-south-1.compute.internal
Instance type	Elastic IP addresses	VPC ID

INSTANCE-2 NAMED AS WEB2:



STEP2: CONNECTED TO INSTANCES

INSTANCE-1 INSTALLED APACHE



INSTANCE-2 INSTALLED APACHE

```
Connect to instance | EC2 | M... x i-0b634e303b515a5f3 (web2) x i-026188dc42e20e40 (web1) x Learn with Upside - Onlin... x LYRICAL: Tera Ban Jaunga | Kal... x +
```

ap-south-1.console.aws.amazon.com/ec2/v2/connect/ec2-user/i-0b634e303b515a5f3

```
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]#
[root@ip-172-31-45-34 html]# systemctl start httpd
[root@ip-172-31-45-34 html]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Tue 2020-11-10 14:25:45 UTC; 9s ago
     Docs: man:httpd.service(8)
  Main PID: 4025 (httpd)
    Status: "Total requests: 5; Idle/Busy workers 100/0;Requests/sec: 0.556; Bytes served/sec: 746 B/sec"
    CGroup: /system.slice/httpd.service
            └─4025 /usr/sbin/httpd -DFOREGROUND
              └─4026 /usr/sbin/httpd -DFOREGROUND
                └─4027 /usr/sbin/httpd -DFOREGROUND
                  └─4028 /usr/sbin/httpd -DFOREGROUND
                    └─4029 /usr/sbin/httpd -DFOREGROUND
                      └─4030 /usr/sbin/httpd -DFOREGROUND

Nov 10 14:25:45 ip-172-31-45-34.ap-south-1.compute.internal systemd[1]: Starting The Apache HTTP Server...
Nov 10 14:25:45 ip-172-31-45-34.ap-south-1.compute.internal systemd[1]: Started The Apache HTTP Server.
[root@ip-172-31-45-34 html]#
```

i-0b634e303b515a5f3 (web2)

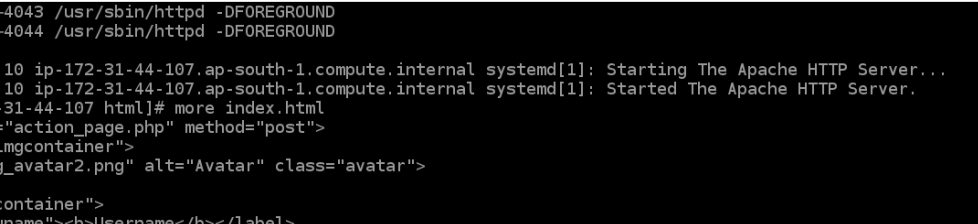
Public IPs: 52.66.214.100 Private IPs: 172.31.45.34

Activate Windows
Go to Settings to activate Windows.

Type here to search

7:55 PM
11/10/2020

STEP3 : HOST HTML LOGIN WEBPAGE ON BOTH SERVERS.



The screenshot displays a web browser window with the address bar showing the URL `ap-south-1.console.aws.amazon.com/ec2/v2/connect/ec2-user/i-026188dc42e20e040`. The main content area shows a terminal window with the following output:

```
4043 /usr/sbin/httpd -DFOREGROUND
4044 /usr/sbin/httpd -DFOREGROUND

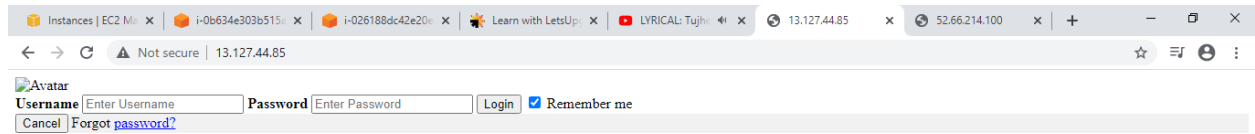
Nov 10 14:15:10 ip-172-31-44-107.ap-south-1.compute.internal systemd[1]: Starting The Apache HTTP Server...
Nov 10 14:15:10 ip-172-31-44-107.ap-south-1.compute.internal systemd[1]: Started The Apache HTTP Server.
[root@ip-172-31-44-107 html]# more index.html
<form action="action_page.php" method="post">
<div class="imgcontainer">

</div>
<div class="container">
<label for="uname"><b>Username</b></label>
<input type="text" placeholder="Enter Username" name="uname" required>
<label for="psw"><b>Password</b></label>
<input type="password" placeholder="Enter Password" name="psw" required>
<button type="submit">Login</button>
<label>
<input type="checkbox" checked="checked" name="remember"> Remember me
</label>
</div>
<div class="container" style="background-color:#f1f1f1">
<button type="button" class="cancelbtn">Cancel</button>
<span class="psw">Forgot <a href="#">password?</a></span>
</div>
</form>
[root@ip-172-31-44-107 html]#
```

Below the terminal window, the browser shows the instance ID `i-026188dc42e20e040 (web1)` and the public IP address `13.127.44.85`. The Windows taskbar at the bottom indicates the time is 7:46 PM on 11/10/2020.

STEP4 : CHECK IF APPLICATION IS DEPLOYED ON BOTH SERVERS BY COPY PASTING THE PUBLIC IP OF THE SERVERS INTO THE BROWSER.

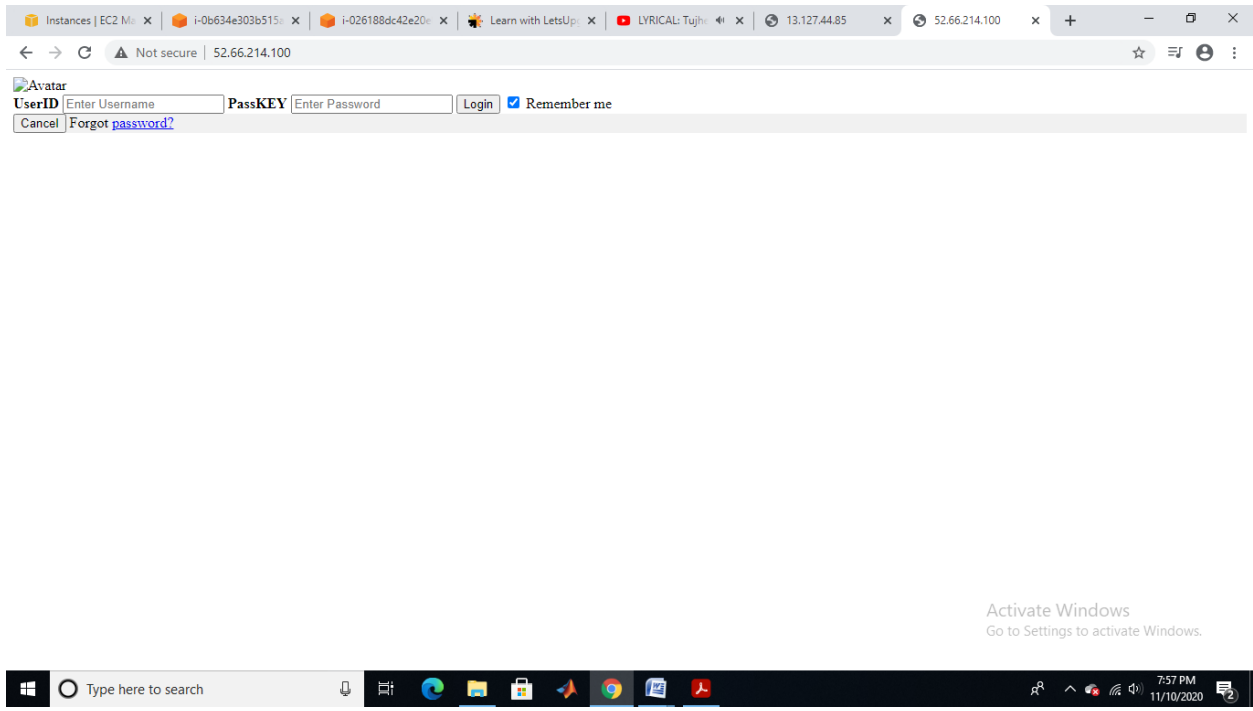
PUBLIC - IP OF INSTANCE-1 IS EXECUTED AND IS SHOWING THE USERNAME AND PASSWORD PAGE ON BROWSER.



Activate Windows
Go to Settings to activate Windows.



PUBLIC - IP OF INSTANCE-2 IS EXECUTED AND IS SHOWING THE UserID AND PassKEY PAGE ON BROWSER.



STEP5 : CREATE A APPLICATION LOAD BALANCER WITH THE ABOVE TWO INSTANCES AS TARGETS.

LOAD BALANCER

- **LOAD BALANCER, AS A TERM ITSELF, GIVES AN IDEA OF ITS WORKING WHICH IS BALANCING THE AMOUNT OF TRAFFIC ON A PARTICULAR SERVER BASED ON THE DEMAND OF SERVER.**
- **A LOAD BALANCER, OR SERVER LOAD BALANCER (SLB), IS A HARDWARE OR SOFTWARE-BASED DEVICE THAT EFFICIENTLY DISTRIBUTES NETWORK OR APPLICATION TRAFFIC ACROSS A NUMBER OF SERVERS.**
- **WITH A LOAD BALANCER, IF A SERVER'S PERFORMANCE SUFFERS FROM EXCESSIVE TRAFFIC OR IF IT STOPS RESPONDING TO REQUESTS, THE LOAD-BALANCING CAPABILITIES WILL AUTOMATICALLY SWITCH THE REQUESTS TO A DIFFERENT SERVER.**
- **THE BENEFITS OF USING LOAD BALANCER ARE AS FOLLOWS:**
 - **HIGH AVAILABILITY AND ELASTICITY**
 - **SECURITY**
 - **ROBUST MONITORING AND VISIBILITY**
 - **INTEGRATION AND GLOBAL REACH**
 - **FEATURE BREADTH**
- **THE TYPES OF LOAD BALANCER ARE AS FOLLOWS:**
 - **CLASSIC LOAD BALANCER**
 - **APPLICATION LOAD BALANCER**
 - **GATEWAY LOAD BALANCER**
 - **NETWORK LOAD BALANCER**

APPLICATION LOAD BALANCER

- AMAZON'S APPLICATION LOAD BALANCER (ALB) PROVIDES LOAD BALANCING, HEALTH MONITORING, AND URL-BASED REQUEST ROUTING ON THE AWS CLOUD. IT OFFERS HTTP AND HTTPS PROTOCOL LOAD BALANCING WITH CUSTOMER SSL CERTIFICATES LOADED FROM ONE OF THE AWS CERTIFICATE MANAGEMENT SERVICES.
- IN ADDITION, ALB ALLOWS AUTO SCALING OF BACKEND ELASTIC COMPUTE CLOUD (EC2) SERVER RESOURCES: WHEN THE TRAFFIC INCREASES, ALB TRIGGERS ADDITIONAL SERVERS TO BE DEPLOYED, AND ALSO REMOVE THEM WHEN DEMAND SUBSIDES. IT ALSO SUPPORTS LOAD BALANCING WEBSOCKET TRAFFIC.
- THE ALB SERVICE ALSO SCALES TO COPE WITH ADDITIONAL LOAD. AS APPLICATION NETWORK TRAFFIC INCREASES, ADDITIONAL ALB INSTANCES ARE CREATED AND REGISTERED WITH DNS, AND TRAFFIC IS THEN DISTRIBUTED TO THE ALB INSTANCES USING DNS ROUND ROBIN.
- FOR BEST PERFORMANCE UNDER SUDDEN WORKLOADS, PRE-WARMING OF ALB INSTANCES IS RECOMMENDED SINCE THE SPIN UP TIME FOR NEW INSTANCES CAN BE BETWEEN ONE AND SEVEN MINUTES.
- ALB CAN BE DEPLOYED VIA WEB CONSOLE, CLI, API, CLOUD FORMATION TEMPLATES (CFTS), AND MANY AUTOMATION TOOLS SUCH AS ANSIBLE.

NETWORK LOAD BALANCER

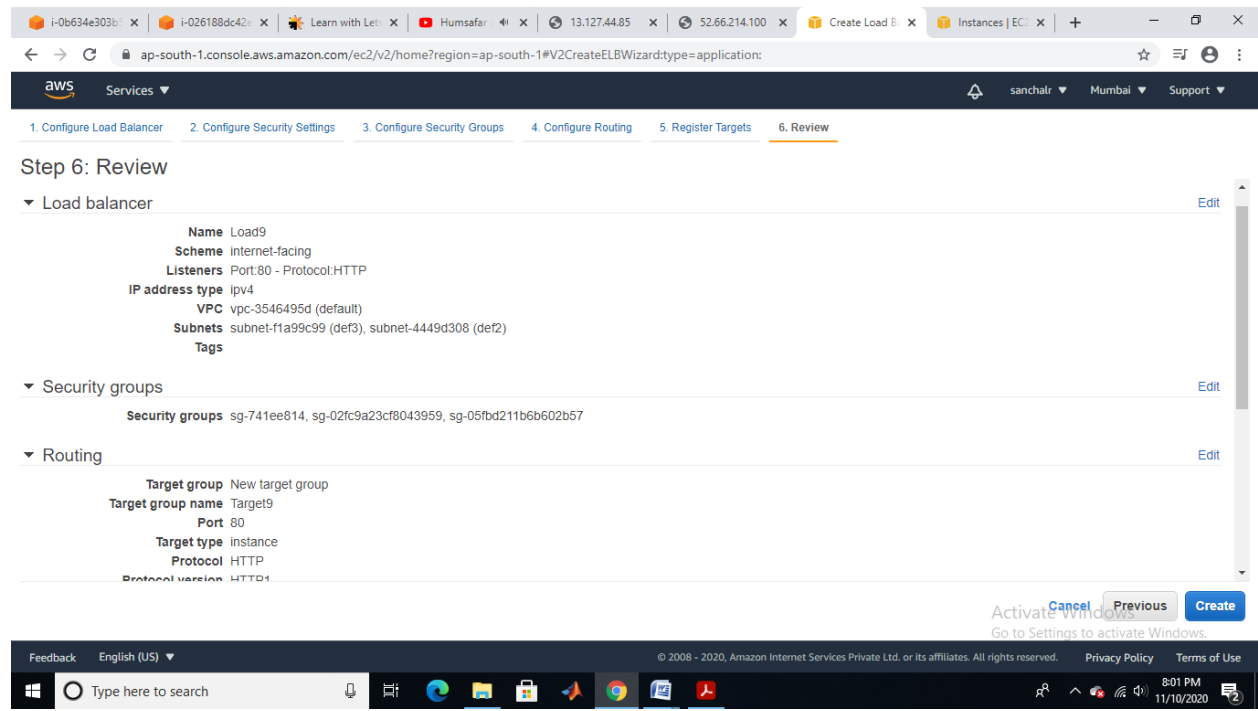
- NLB OPERATES AT LAYER 4 AND OFFERS CONNECTION-BASED LOAD BALANCING AND NETWORK- AND APPLICATION-LAYER HEALTH CHECKS.
- NLB IS DESIGNED TO COPE WELL WITH TRAFFIC SPIKES AND HIGH VOLUMES OF CONNECTIONS. IN ADDITION, NLB ALLOWS TARGETS TO BE RFC 1918 PRIVATE IP ADDRESSES AS WELL AS EC2 INSTANCES. THE AUTOSCALING, SELF-SCALING, AND DEPLOYMENT OPTIONS ARE SIMILAR TO ALB.

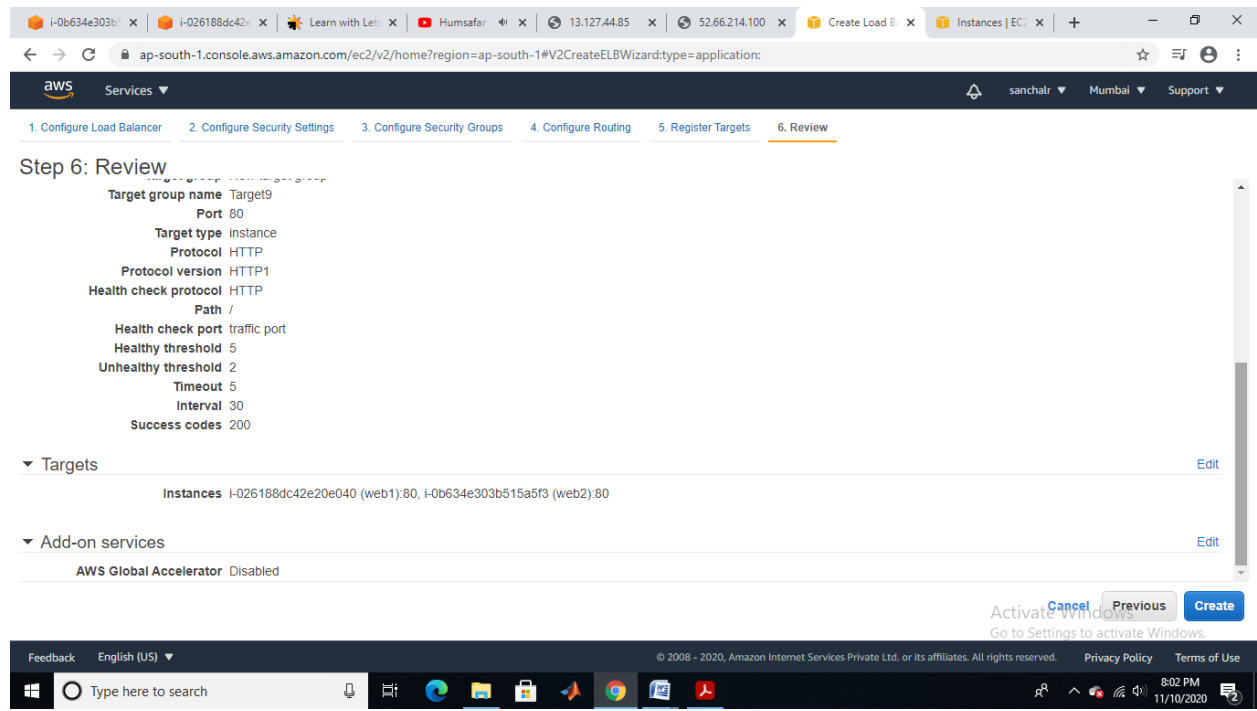
CLASSIC LOAD BALANCER

- THE AWS CLASSIC LOAD BALANCER (CLB) OPERATES AT LAYER 4 OF THE OSI MODEL THAT DEPICTS THE LOAD BALANCER ROUTES TRAFFIC BETWEEN CLIENTS AND BACKEND SERVERS BASED ON IP ADDRESS AND TCP PORT.
- IN THE DEFAULT CONFIGURATION, THE CLASSIC LOAD BALANCER WILL ROUTE TRAFFIC EVENLY BETWEEN AVAILABILITY ZONES (AZ) THAT ARE ENABLED IN THE ELB. DUE TO THE WAY SOME CLIENTS HANDLE DNS, LOAD IMBALANCE CAN OCCUR IF THERE AREN'T AN EQUAL NUMBER OF SERVERS TO ANSWER REQUESTS IN EACH AZ WITH THIS CONFIGURATION.
- WITH CROSS-ZONE LOAD BALANCING ENABLED, TRAFFIC WILL BE DISTRIBUTED EVENLY AMONGST ALL INSTANCES IN ALL AVAILABILITY ZONES THAT ARE ENABLED IN THE ELB.
- ENABLING CROSS-ZONE LOAD BALANCING WILL HELP TO MITIGATE POTENTIAL LOAD IMBALANCE AND ALSO ENSURE BETTER AVAILABILITY OF YOUR APPLICATION.

GATEWAY LOAD BALANCER

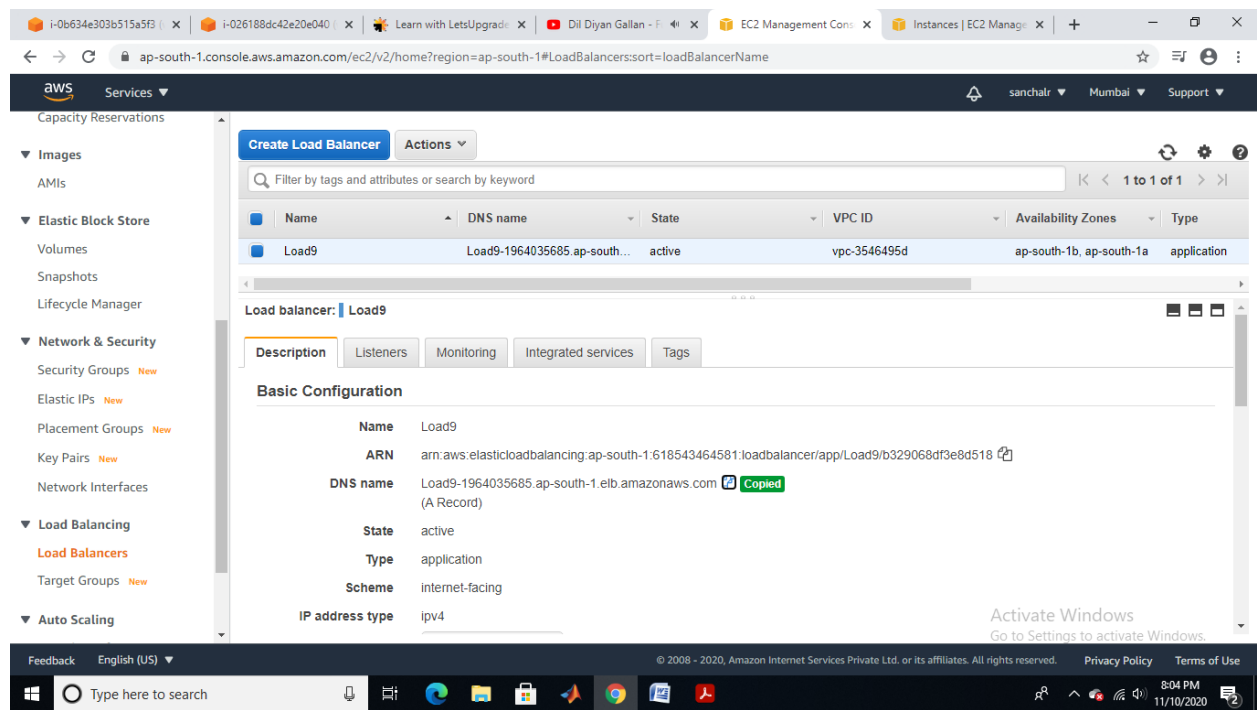
- GATEWAY LOAD BALANCER MAKES IT EASY TO DEPLOY, SCALE, AND RUN THIRD-PARTY VIRTUAL NETWORKING APPLIANCES.
- GLB IS TRANSPARENT TO THE SOURCE AND DESTINATION OF TRAFFIC AND IT PROVIDES LOAD BALANCING AND AUTO SCALING FOR FLEETS OF THIRD-PARTY APPLIANCES.
- THIS CAPABILITY MAKES IT WELL SUITED FOR WORKING WITH THIRD-PARTY APPLIANCES FOR SECURITY, NETWORK ANALYTICS, AND OTHER USE CASES.



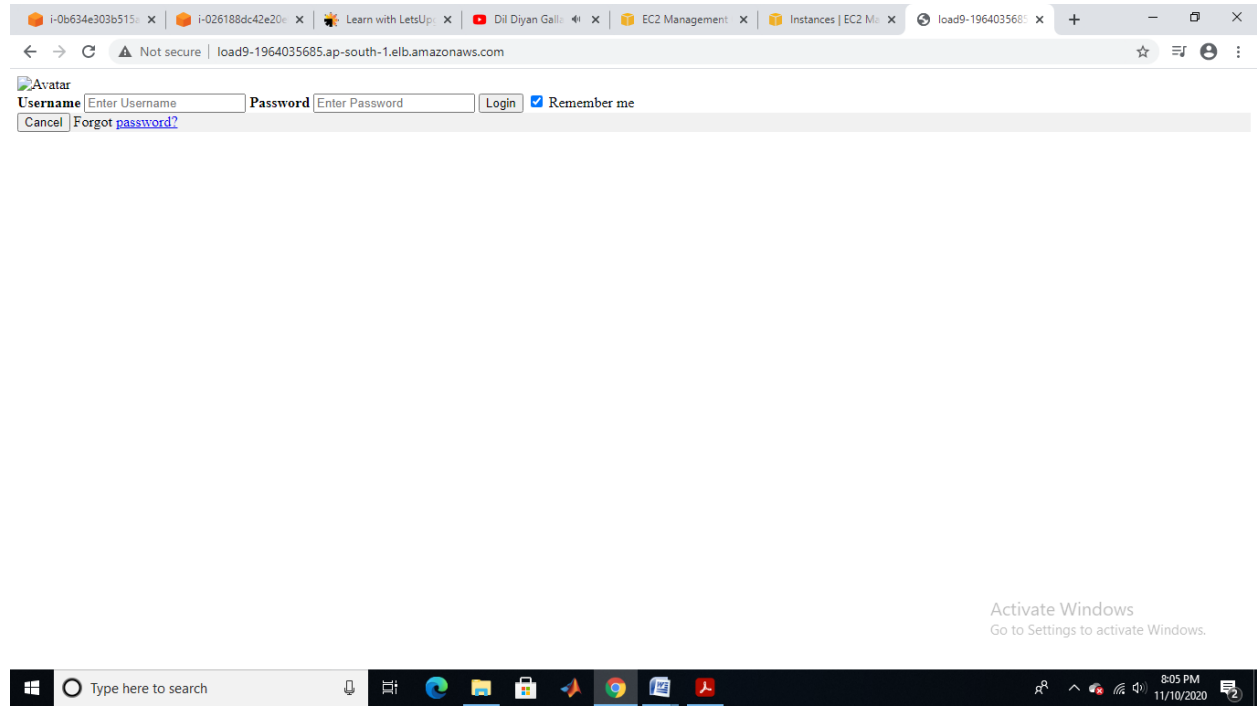


STEP6 : CHECK THE FUNCTIONING OF ELB USING THE DNS OF THE ELB .

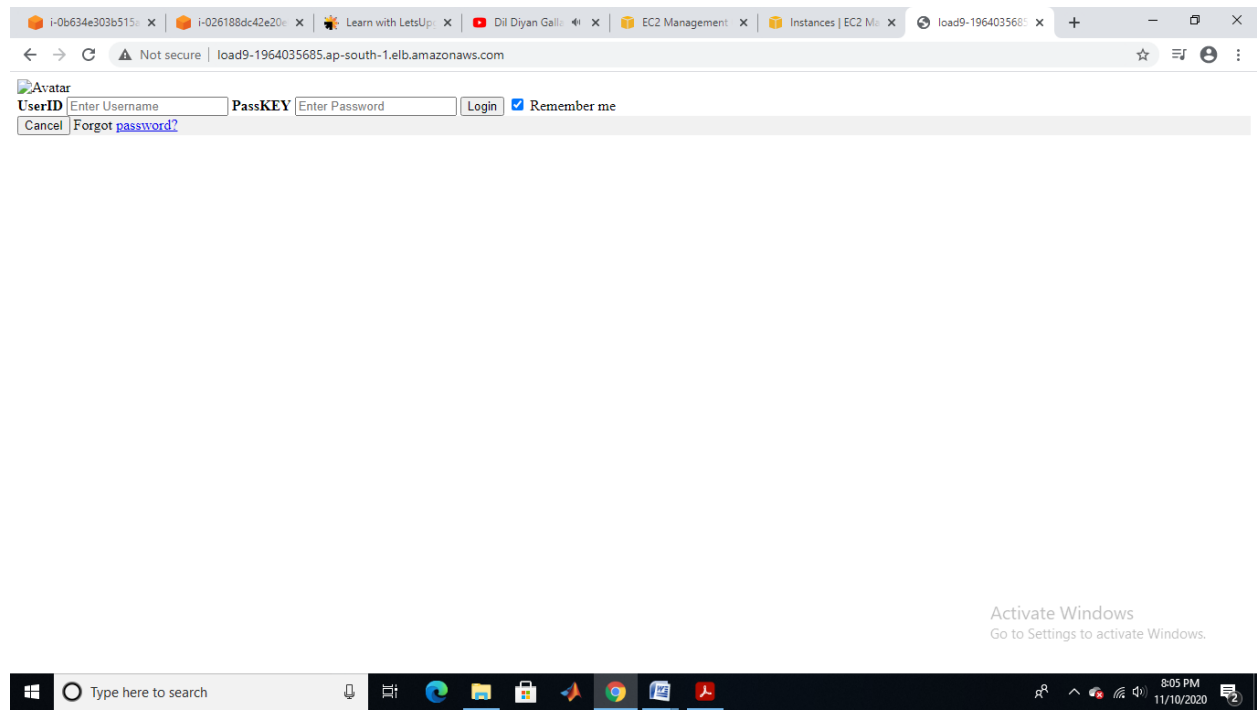
DNS NAME OF APPLICATION LOAD BALANCER IS COPIED FROM DESCRIPTION TAB AND PASTED IN BROWSER TO CHECK THE WORKING OF IMPLEMENTATION



**AFTER EXECUTING IN BROWSER, SERVER1 USERNAME AND PASSWORD PAGE IS DISPLAYED
ACCORDING TO LOAD.**



**AFTER EXECUTING IN BROWSER THE NEXT TIME, SERVER2 USERID AND PASKEY PAGE IS DISPLAYED
ACCORDING TO LOAD.**



AND THE PROCESS CONTINUES ACCORDING TO THE DEMAND INCREASE AND DECREASE. HENCE, ALB DISTRIBUTES THE LOAD AMONG SERVERS DEPENDING ON DEMAND AND BALANCES LOAD, EVEN WHEN DEMAND SUBSIDES.

