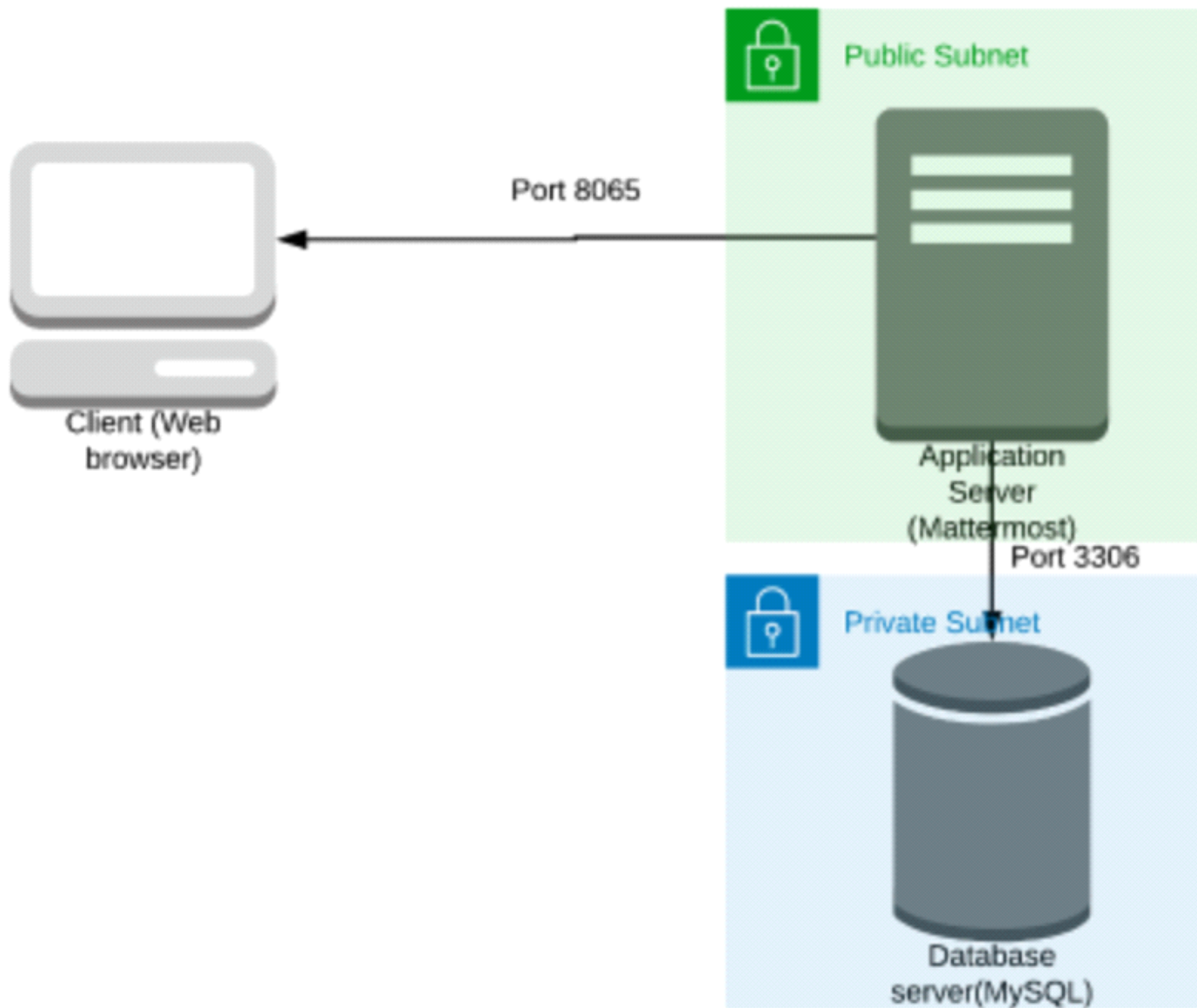


Some organizations might have compliance policies in place which do not allow them to use services managed by third parties. They will prefer solutions that can be managed and hosted on servers controlled by them. The same will extend to communication solutions as well.

#### Architecture diagram



## Architecture Implementation

1	Implement 2 different subnets (one public and the other private) in a custom VPC
2	Install and configure MySQL on an Amazon Linux 2 instance on the private subnet using the instructions provided. (Hint: Use a bastion host and a NAT gateway)
3	Install and configure Mattermost on an Amazon Linux 2 instance on the public subnet using the provided instructions.
4	Configure the security groups to allow the ports as shown in the architecture.
5	Test the installation by accessing the IP of the public instance in a browser via the port 8065.

### Step 1: VPC and Subnet Creation

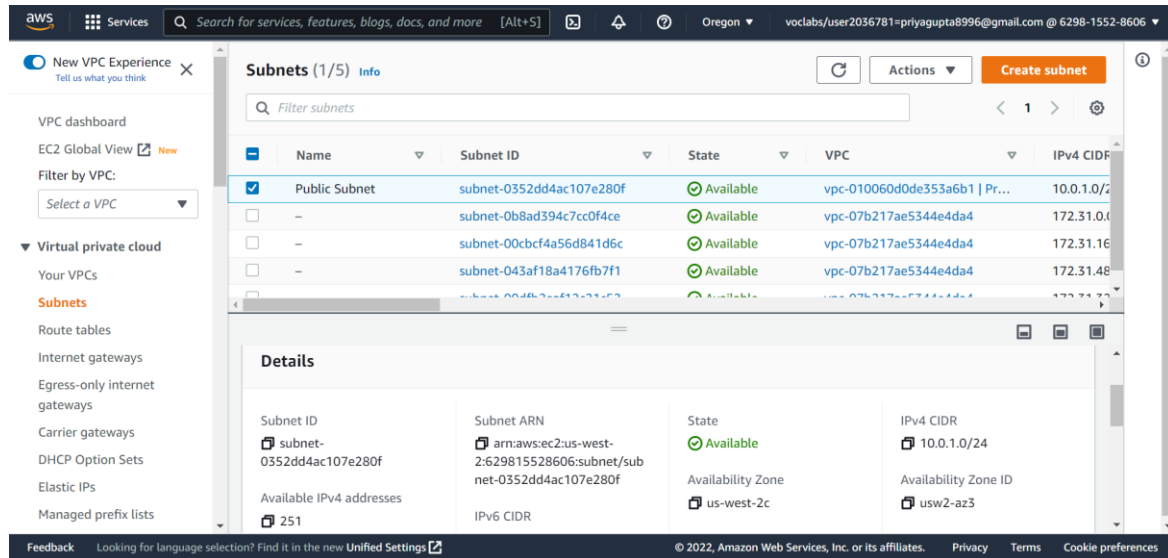
Step number	a		
Step name	Creation of VPC		
Expected screenshots	<ul style="list-style-type: none"> <li>Created VPC with properties visible</li> </ul>		

#### Created VPC with properties value

The screenshot shows the AWS Management Console interface for 'Your VPCs'. The table lists two VPCs. The first VPC, 'vpc-07b217ae5344e4da4', is in an 'Available' state with an IPv4 CIDR of 172.31.0.0/16. The second VPC, 'Project 1 VPC' (ID: vpc-010060d0de353a6b1), is also in an 'Available' state with an IPv4 CIDR of 10.0.0.0/16. The details for 'Project 1 VPC' are expanded, showing various configuration options like DNS hostnames, DNS resolution, Tenancy, DHCP option set, Main route table, Main network ACL, Default VPC, IPv4 CIDR, IPv6 pool, and IPv6 CIDR.

Step number	b		
Step name	Creation of public subnet		
Expected screenshots	<ul style="list-style-type: none"> <li>Subnet Creation screen</li> </ul>		

## Subnet creation screen result:



The screenshot shows the AWS Management Console interface for the 'Subnets (1/5)' page. The left sidebar contains navigation links for VPC dashboard, EC2 Global View, and various VPC resources. The main content area displays a table of subnets with columns for Name, Subnet ID, State, VPC, and IPv4 CIDR. The 'Public Subnet' is selected, and its details are shown in the 'Details' section below the table. The details include Subnet ID, Subnet ARN, State (Available), Availability Zone, and IPv4 CIDR.

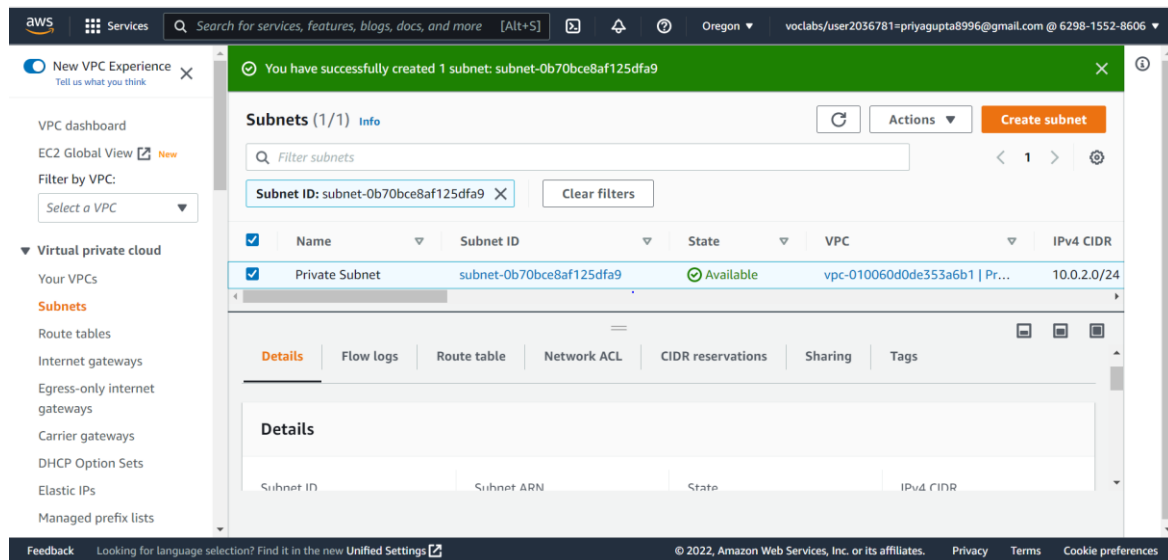
Name	Subnet ID	State	VPC	IPv4 CIDR
Public Subnet	subnet-0352dd4ac107e280f	Available	vpc-010060d0de353a6b1   Pr...	10.0.1.0/24
-	subnet-0b8ad394c7cc0f4ce	Available	vpc-07b217ae5344e4da4	172.31.0.0/24
-	subnet-00cbcf4a56d841d6c	Available	vpc-07b217ae5344e4da4	172.31.16.0/24
-	subnet-043af18a4176fb7f1	Available	vpc-07b217ae5344e4da4	172.31.48.0/24

**Details**

Subnet ID	Subnet ARN	State	IPv4 CIDR
subnet-0352dd4ac107e280f	arn:aws:ec2:us-west-2:629815528606:subnet/subnet-0352dd4ac107e280f	Available	10.0.1.0/24
Available IPv4 addresses	IPv6 CIDR	Availability Zone	Availability Zone ID
251		us-west-2c	usw2-az3

Step number	c
Step name	Creation of private subnet
Expected screenshots	<ul style="list-style-type: none"><li>Subnet Creation screen</li></ul>

## Subnet Creation screen



The screenshot shows the AWS Management Console interface for the 'Subnets (1/1)' page after successful creation. A green notification banner at the top states 'You have successfully created 1 subnet: subnet-0b70bce8af125dfa9'. The page displays a single 'Private Subnet' in the list, and the 'Details' section shows its configuration.

Name	Subnet ID	State	VPC	IPv4 CIDR
Private Subnet	subnet-0b70bce8af125dfa9	Available	vpc-010060d0de353a6b1   Pr...	10.0.2.0/24

**Details**

Subnet ID	Subnet ARN	State	IPv4 CIDR
subnet-0b70bce8af125dfa9	arn:aws:ec2:us-west-2:629815528606:subnet/subnet-0b70bce8af125dfa9	Available	10.0.2.0/24

## Step 2 : Internet Gateway and VPC

Step number	a	
Step name	Creation and Configuration of Internet Gateway	
Expected screenshots	<ul style="list-style-type: none"><li>Creation of Internet Gateway</li></ul>	

### Creation of Internet Gateway

The screenshot shows the AWS Management Console interface. A green notification banner at the top states: "Internet gateway igw-0695b71be9da89cd7 successfully attached to vpc-010060d0de353a6b1". The main content area displays the details for the Internet Gateway "igw-0695b71be9da89cd7 / Project 1 Internet Gateway".

**Details:**

- Internet gateway ID: igw-0695b71be9da89cd7
- State: Attached
- VPC ID: vpc-010060d0de353a6b1 | Project 1 VPC
- Owner: 629815528606

**Tags:**

Key	Value
Name	Project 1 Internet Gateway

Step number	b	
Step name	Creation of public route table	
Expected screenshots	<ul style="list-style-type: none"><li>Route list of the route table</li><li>Subnet Associations of the route table</li></ul>	

### Route list of route table

The screenshot shows the AWS Management Console interface. A green notification banner at the top states: "You have successfully updated subnet associations for rtb-01c6a2ee5d3f93923 / Public Route Table." The main content area displays the details for the Route Table "rtb-01c6a2ee5d3f93923 / Public Route Table".

**Routes (2):**

Destination	Target	Status	Propagated
0.0.0.0/0	igw-0695b71be9da89cd7	Active	No
10.0.0.0/16	local	Active	No

## Subnet Associations of the route table

The screenshot shows the AWS Management Console interface for 'Subnet associations'. The left sidebar contains navigation links for VPC dashboard, EC2 Global View, and various VPC resources. The main content area is titled 'Subnet associations' and shows two lists of subnets. The first list, 'Explicit subnet associations (1)', contains one public subnet. The second list, 'Subnets without explicit associations (1)', contains one private subnet. Both lists have an 'Edit subnet associations' button.

Subnet ID	IPv4 CIDR	IPv6 CIDR
subnet-0352dd4ac107e280f / Public Subnet	10.0.1.0/24	-
subnet-0b70bce8af125dfa9 / Private Subnet	10.0.2.0/24	-

Step number	c			
Step name	Creation of NAT gateway			
Expected screenshots	<ul style="list-style-type: none"> <li>NAT gateway creation details</li> <li>Gateway after creation</li> </ul>			

## NAT gateway creation details:

The screenshot shows the AWS Management Console interface for 'NAT gateway creation details'. A green success message is displayed at the top. The main content area shows the details of the NAT gateway 'nat-0e1181c6fbf9f04bd'. The 'Details' tab is selected, showing information about the NAT gateway ID, ARN, connectivity type (Public), state (Pending), and creation time (Monday, August 8, 2022 at 24:40:08 GMT+5:30).

Field	Value
NAT gateway ID	nat-0e1181c6fbf9f04bd
NAT gateway ARN	arn:aws:ec2:us-west-2:629815528606:natgateway/nat-0e1181c6fbf9f04bd
Connectivity type	Public
Elastic IP address	-
Subnet	subnet-0352dd4ac107e280f / Public Subnet
VPC	vpc-010060d0de353a6b1 / Project 1 VPC
State	Pending
Private IP address	-
Created	Monday, August 8, 2022 at 24:40:08 GMT+5:30
State message	-
Network interface ID	-
Deleted	-

## Gateway after creation:

The screenshot shows the AWS Management Console for a user in the Oregon region. The left sidebar lists various services, with 'NAT gateways' highlighted under the 'Network' section. The main content area displays the 'NAT gateways (1/1)' page. A table lists the NAT gateway 'Project 1 VPC' with ID 'nat-0e1181c6fbf9f04bd', connectivity type 'Public', and state 'Available'. Below the table, the 'Details' tab is selected, showing the following information:

Property	Value
NAT gateway ID	nat-0e1181c6fbf9f04bd
Connectivity type	Public
State	Available
State message	-
NAT gateway ARN	arn:aws:ec2:us-west-2:629815528606:natgateway/nat-0e1181c6fbf9f04bd
Elastic IP address	52.33.253.1
Private IP address	10.0.1.135
Network interface ID	eni-00f2ceb1485a83cb0
Subnet	subnet-0352dd4ac107e...
Created	2022-11-15 15:00:00 UTC
Deleted	-

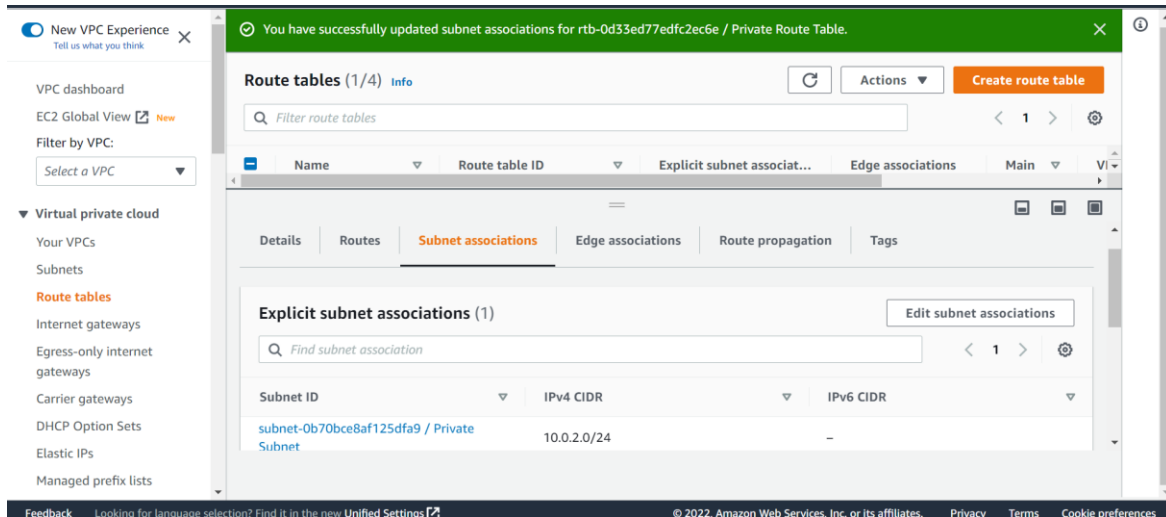
Step number	d			
Step name	Creation of private route tables			
Expected screenshots	<ul style="list-style-type: none"> <li>Route list of the route table</li> <li>Subnet association of the route table</li> </ul>			

## Route list of the route table

The screenshot shows the AWS Management Console for a user in the Oregon region. The left sidebar lists various services, with 'Route tables' highlighted under the 'Virtual private cloud' section. The main content area displays the 'Route tables (1/4)' page. A table lists the route tables, with the 'Private Route Table' (ID: rtb-0d33ed77edfc2ec6e) selected. Below the table, the 'Route list' tab is selected, showing the following information:

Destination	Target	Status	Propagated
0.0.0.0/0	nat-0e1181c6fbf9f04bd	Active	No
10.0.0.0/16	local	Active	No

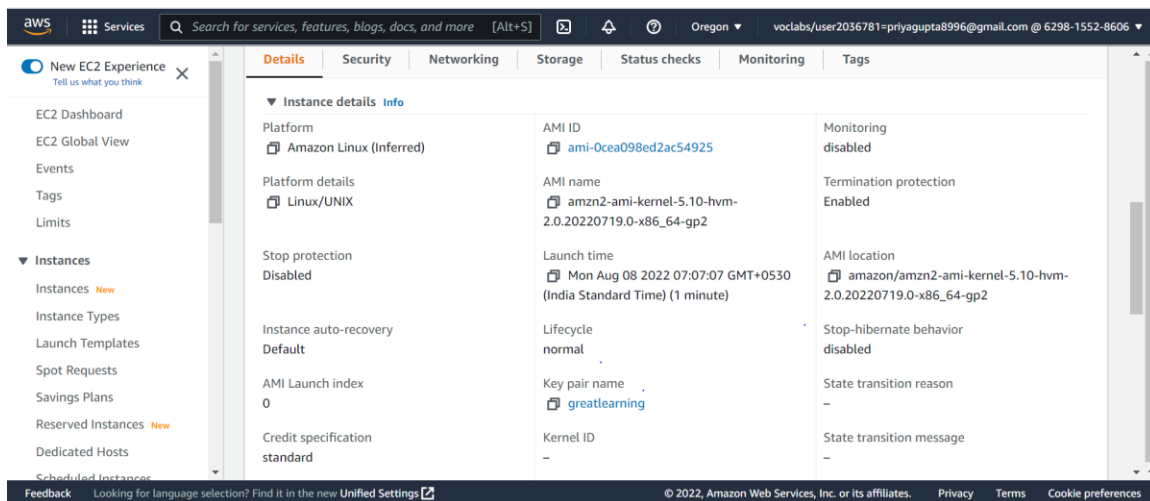
## Subnet association of the route table



## Step 3 : Creation of database and application servers

Step number	a
Step name	Creation of application server
Expected screenshots	<ul style="list-style-type: none"> <li>• AMI used</li> <li>• Instance configuration screen</li> <li>• Security group rules</li> <li>• Instance after creation</li> </ul>

## AMI used



## Instance configuration screen

The screenshot shows the AWS Management Console's 'Instance configuration' screen. The left sidebar contains navigation links for 'New EC2 Experience', 'EC2 Dashboard', 'EC2 Global View', 'Events', 'Tags', 'Limits', and 'Instances'. The 'Instances' section is expanded, showing links for 'Instances', 'Instance Types', 'Launch Templates', 'Spot Requests', 'Savings Plans', 'Reserved Instances', and 'Dedicated Hosts'. The main content area is titled 'Instance configuration' and includes tabs for 'Details', 'Security', 'Networking', 'Storage', 'Status checks', 'Monitoring', and 'Tags'. The 'Storage' tab is selected, displaying 'Root device details' and 'Block devices'. The 'Root device details' section shows the 'Root device name' as '/dev/xvda' and the 'Root device type' as 'EBS'. The 'Block devices' section shows a table with one device: 'vol-0a36eed2afb27d4c3' with a 'Device name' of '/dev/xvda', a 'Volume size (GiB)' of 8, an 'Attachment status' of 'Attached', and an 'Attachment time' of 'Mon Aug 08 2022 07:07:07 ...'. The bottom of the screen features a footer with 'Feedback', a language selection link, copyright information, and links for 'Privacy', 'Terms', and 'Cookie preferences'.

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New EC2 Experience Tell us what you think

EC2 Dashboard  
EC2 Global View  
Events  
Tags  
Limits

▼ Instances  
Instances **New**  
Instance Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances **New**  
Dedicated Hosts  
Scheduled Instances

IAM Role  
Subnet ID  
Auto Scaling Group name

subnet-0352dd4ac107e280f (Public Subnet)

Details Security Networking **Storage** Status checks Monitoring Tags

▼ Root device details

Root device name  
/dev/xvda

Root device type  
EBS

EBS optimization  
disabled

▼ Block devices

Filter block devices

Volume ID	Device name	Volume size (GiB)	Attachment status	Attachment time
vol-0a36eed2afb27d4c3	/dev/xvda	8	Attached	Mon Aug 08 2022 07:07:07 ...

▼ Recent root volume replacement tasks

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## Security group rules

The screenshot shows the AWS Management Console's 'Security group rules' screen. The left sidebar is identical to the previous screenshot. The main content area is titled 'Security group rules' and includes tabs for 'Security details', 'Inbound rules', and 'Outbound rules'. The 'Inbound rules' tab is selected, displaying a table with four rules. The rules are: 'sgr-0869fc72b9a5d488f' with port range 80, 'sgr-0e800f60935c82482' with port range 443, 'sgr-0245d5420a69841f7' with port range 22, and 'sgr-0ee246e814a929666' with port range 8065. All rules have a protocol of 'TCP' and a source of '0.0.0.0/0'. The 'Security groups' column for all rules is 'launch-wizard-1'. The bottom of the screen features a footer with 'Feedback', a language selection link, copyright information, and links for 'Privacy', 'Terms', and 'Cookie preferences'.

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New EC2 Experience Tell us what you think

EC2 Dashboard  
EC2 Global View  
Events  
Tags  
Limits

▼ Instances  
Instances **New**  
Instance Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances **New**  
Dedicated Hosts  
Scheduled Instances

▼ Security details

IAM Role  
Owner ID  
Launch time

Security groups  
sg-0eb56852ee8ba31ce (launch-wizard-1)

629815528606

Mon Aug 08 2022 07:07:07 GMT+0530 (India Standard Time)

▼ Inbound rules

Filter rules

Security group rule ID	Port range	Protocol	Source	Security groups
sgr-0869fc72b9a5d488f	80	TCP	0.0.0.0/0	launch-wizard-1
sgr-0e800f60935c82482	443	TCP	0.0.0.0/0	launch-wizard-1
sgr-0245d5420a69841f7	22	TCP	0.0.0.0/0	launch-wizard-1
sgr-0ee246e814a929666	8065	TCP	0.0.0.0/0	launch-wizard-1

▼ Outbound rules

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## Instance after creation

The screenshot displays the AWS Management Console interface for the 'Instances' page. The top navigation bar includes the AWS logo, 'Services', a search bar, and the user's account information (Oregon, voelabs/user2036781=priyagupta8996@gmail.com @ 6298-1552-8606). The left sidebar shows the 'New EC2 Experience' and a list of navigation options: EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, and Scheduled Instances. The main content area is titled 'Instances (1/1) Info' and features a table with one instance. The instance is named 'i-0b7ef5a0c66963e7c', is in the 'Running' state, and is of type 't2.micro'. Below the table, a detailed view for the selected instance is shown, including tabs for Details, Security, Networking, Storage, Status checks, Monitoring, and Tags. The 'Details' tab is active, displaying the instance ID, public IPv4 address (54.149.211.1), private IPv4 address (10.0.1.201), and other relevant information.

**Instances (1/1) Info**

Name	Instance ID	Instance state	Instance type	Status check	Alarm status
-	i-0b7ef5a0c66963e7c	Running	t2.micro	2/2 checks passed	No alarms

**Instance: i-0b7ef5a0c66963e7c**

**Details** | Security | Networking | Storage | Status checks | Monitoring | Tags

**Instance summary Info**

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0b7ef5a0c66963e7c	54.149.211.1   <a href="#">open address</a>	10.0.1.201
IPv6 address	Instance state	Public IPv4 DNS

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