

# AWS Sysops Administrator Project

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Company: Vodafone

**Main project (Description):** You are a Cloud engineer working on a Team Communication Solution project for a big MNC. The client has compliance policies which do not allow them to use services managed by third parties. The client wants a team communication solution that can be managed and hosted on servers that are controlled by them.

Steps to perform

- 1) Implement two different subnets (one public and the other private) in a custom VPC
- 2) Install and configure MySQL on an Ubuntu 18.04 instance on the private subnet (Hint: Use a bastion host and a NAT instance)
- 3) Install and configure Mattermost on an Ubuntu 18.04 instance on the public subnet
- 4) Configure the security groups to allow the ports
- 5) Test the installation by accessing the IP of the public instance in a browser

VPC > Your VPCs > vpc-0a05290b928e585be

vpc-0a05290b928e585be / mattermost-vpc

Details info

VPC ID vpc-0a05290b928e585be	State Available	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP options set dopt-1c91f466	Route table rtb-02325b6a8326df6ca	Network ACL acl-06e038348542add78
Default VPC No	IPv4 CIDR 10.0.0.0/16	IPv6 pool -	IPv6 CIDR (Network border group) -
Owner ID 684742223434			

CIDRs

Flow logs

Tags

IPv4 CIDRs info

CIDR	Status
10.0.0.0/16	Associated

IPv6 CIDRs info

CIDR	Pool	Status
------	------	--------

You have no IPv6 CIDR blocks associated with your VPC.

Screenshot 1:

VPC named "mattermost-vpc" created with CIDR 10.0.0.0/16

VPC > Internet gateways > igw-06f77984ee61bd9bf

igw-06f77984ee61bd9bf / mattermost-internet-gateway

DetailsInfo

Internet gateway ID

igw-06f77984ee61bd9bf

State

Detached

VPC ID

-

Owner

684742223434

Tags

Search tags

Key

Value

Name

mattermost-internet-gateway

Screenshot 2:

Internet Gateway named as "mattermost-internet-gateway" created.

Internet gateways (2)Info

Filter internet gateways

Name

Internet gateway ID

State

VPC ID

Owner

mattermost-intern...

igw-06f77984ee61bd9bf

Attached

vpc-0a05290b928e585be | mattermost-vpc

684742223434

-

igw-86d4fbfd

Attached

vpc-526d952f

684742223434

Screenshot 3:

Internet Gateway "mattermost-internet-gateway" is attached to "mattermost-vpc".

Create route tableActions

Filter by tags and attributes or search by keyword

Name

Route Table ID

Explicit subnet association

Edge associations

Main

VPC ID

Owner

rtb-6bdd9a15

-

-

Yes

vpc-526d952f

684742223434

mainRouteTable

rtb-02325b6a8326dff6ca

-

-

Yes

vpc-0a05290b928e585be | mattermost-vpc

684742223434

Screenshot 4:

Already existing route table is renamed to "mainRouteTable".

Subnets (1/1)Info

Filter subnets

public-mattermost-subnet

Clear filters

Name

Subnet ID

State

VPC

IPv4 CIDR

Available IPv4 addresses

Availability Zone

Route table

Defi

public-mattermost-...

subnet-0b569cf9a991547d0

Available

vpc-0a05290b928e585be | ma...

10.0.1.0/24

251

us-east-1e

rtb-02325b6a8326dff6ca | mainRouteTable

No

Screenshot 5:

Public subnet named as "public-mattermost-subnet" created with CIDR 10.0.1.0/24. This subnet is attached to "mainRouteTable" route table.

	Name	Route Table ID	Explicit subnet association	Edge associations	Main	VPC ID	Owner
<input type="checkbox"/>		rtb-6bdd9a15	-	-	Yes	vpc-526d952f	684742223434
<input type="checkbox"/>	public-route-table	rtb-038ae87640789f76d	-	-	No	vpc-0a05290b928e585be   mattermost-vpc	684742223434
<input type="checkbox"/>	mainRouteTable	rtb-02325b6a8326df6ca	-	-	Yes	vpc-0a05290b928e585be   mattermost-vpc	684742223434

### Screenshot 6:

Public route table named as "public route table" created. This public route table should be assigned to public subnet.

Route Tables > Edit routes

### Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
0.0.0.0/0	igw-06f77984ee61bd9b4		No

Add route

\* Required

Cancel Save routes

### Screenshot 7:

Assign new route for destination "0.0.0.0/0" to the Internet Gateway on public route table.

VPC > Subnets > subnet-0b569cf9a991547d0 > Modify auto-assign IP settings

## Modify auto-assign IP settings [Info](#)

Enable the auto-assign IP address setting to automatically request a public IPv4 or IPv6 address for a new network interface in this subnet.

### Settings

Subnet ID  
☐ subnet-0b569cf9a991547d0

Auto-assign IPv4 [Info](#)  
☒ Enable auto-assign public IPv4 address

Auto-assign customer-owned IPv4 address [Info](#)  
☐ Enable auto-assign customer-owned IPv4 address  
Option disabled because no customer owned pools found.

Cancel Save

### Screenshot 8:

Enable auto-assign public Ipv4 address to public subnet.

Subnets (1/1) [Info](#)

Filter subnets

Name: public-mattermost-subnet X Clear filters

<input checked="" type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	Available IPv4 addresses	Availability Zone	Route table
<input checked="" type="checkbox"/>	public-mattermost-...	subnet-0b569cf9a991547d0	Available	vpc-0a05290b928e585be   ma...	10.0.1.0/24	251	us-east-1e	rtb-038ae87640789f76d   public-route-table

## Screenshot 9:

Attach public route table to public subnet because we need the public subnet to be accessible from the internet.

Subnets (2) [Info](#)

Filter subnets

search: matter X Clear filters

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	Available IPv4 addresses	Availability Zone	Route table
<input type="checkbox"/>	private-mattermost-subnet	subnet-0d1d72950cfefacfc	Available	vpc-0a05290b928e585be   ma...	10.0.2.0/24	251	us-east-1e	rtb-02325b6a8326df6ca   mainRouteTable
<input type="checkbox"/>	public-mattermost-subnet	subnet-0b569cf9a991547d0	Available	vpc-0a05290b928e585be   ma...	10.0.1.0/24	251	us-east-1e	rtb-038ae87640789f76d   public-route-table

## Screenshot 10:

Private subnet named as "private-mattermost-subnet" created with CIDR 10.0.2.0/24. This subnet is attached to "mainRouteTable" route table because this subnet should not be exposed to the internet.

aws Services ▾

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of th

**Number of instances** ⓘ 1 [Launch into Auto Scaling Group](#) ⓘ

**Purchasing option** ⓘ ☐ Request Spot instances

**Network** ⓘ vpc-0a05290b928e585be | mattermost-vpc [Create new VPC](#)

**Subnet** ⓘ subnet-0b569cf9a991547d0 | public-mattermost-subr [Create new subnet](#)  
251 IP Addresses available

**Auto-assign Public IP** ⓘ Enable

**Placement group** ⓘ ☐ Add instance to placement group

**Capacity Reservation** ⓘ Open

## Screenshot 11:

Create a dedicated NAT EC2 instance on "mattermost-vpc" VPC and on public subnet. (The solution with EC2 as NAT instance did not work, that's why in a later step I use a VPC NAT Gateway instead)

EC2 > Instances > i-0871cc8a6d5946f36 > Change source / destination check

**Source / destination check** [Info](#)

Each EC2 instance performs source and destination checks by default. The instance must be the source or destination of all the traffic it sends and receives.

Instance ID  
 i-0871cc8a6d5946f36 (NAT)

Network interface [Info](#)  
 eni-0aedd466c755a0b93

Source / destination checking [Info](#)  
☒ Stop

If this is a NAT instance, you must stop source / destination checking. A NAT instance must be able to send and receive traffic when the source or destination is not itself.

▼ **AWS CLI Command**

```
aws ec2 modify-instance-attribute --instance-id=i-0871cc8a6d5946f36 --no-source-dest-check
```

Copy

Cancel
Save

**Screenshot 12:**  
Disable "Source / destination checking" on NAT EC2 instance. (The solution with EC2 as NAT instance did not work, that's why in a later step I use a VPC NAT Gateway instead)

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

AMI Details

**Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-00ddb0e5626798373**  

Free tier eligible

Ubuntu Server 18.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).  
 Root Device Type: ebs    Virtualization type: hvm

Instance Type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	-	1	1	EBS only	-	Low to Moderate

Security Groups

Security group name
 launch-wizard-4

Description
 launch-wizard-4 created 2020-12-06T19:48:07.510+02:00

Type <a href="#">i</a>	Protocol <a href="#">i</a>	Port Range <a href="#">i</a>	Source <a href="#">i</a>	Description <a href="#">i</a>
SSH	TCP	22	10.0.1.0/24	
HTTP	TCP	80	10.0.1.0/24	

Instance Details

Storage

**Screenshot 13:**  
Security group of the EC2 instance that will host the MySQL database and will exist on private subnet. This EC2 instance must accept traffic and SSH connection from the public subnet (10.0.1.0/24).

Instances (4) info										
Name	Instance ID	Instance state	Instance type	Status check	Availability Zone	Public IPv4 ...	Elastic IP	Key name	Launch time	Subnet IDs
Bastion	i-0603c7878f355eb73	Running	t2.micro	2/2 checks ...	us-east-1e	18.209.152.164	-	amazonKey	2020/12/06 19:42 ...	subnet-0b569cf...
NAT	i-0871cc8a6d5946f36	Running	t2.micro	2/2 checks ...	us-east-1e	54.164.111.198	-	amazonKey	2020/12/06 19:37 ...	subnet-0b569cf...
mattermost-host	i-080928552b38a46af	Running	t2.micro	2/2 checks ...	us-east-1e	100.26.155.57	-	amazonKey	2020/12/06 19:46 ...	subnet-0b569cf...
sql-host-private	i-00ae4d207446d5f74	Running	t2.micro	2/2 checks ...	us-east-1e	-	-	amazonKey	2020/12/06 19:49 ...	subnet-0d1d729...

## Screenshot 14:

All EC2 instances are ready. We need four (4) EC2 instances.

-A bastion EC2 on public subnet to connect to MySQL instance on private subnet.

-A NAT EC2 on public subnet to redirect traffic from private subnet to the internet (The solution with EC2 as NAT instance did not work, that's why in a later step I use a VPC NAT Gateway instead).

-A mattermost-host instance on public subnet to install the mattermost application. This instance must have access to the MySQL server on private subnet.

-A MySQL EC2 instance on private subnet to install MySQL database.

Create route table Actions							
Filter by tags and attributes or search by keyword							
Name	Route Table ID	Explicit subnet association	Edge associations	Main	VPC ID	Owner	
public-route-table	rtb-038ae87640789f76d	subnet-0b569cf9a991547d0	-	No	vpc-0a05290b928e585be   mattermost-vpc	684742223434	
mainRouteTable	rtb-02325b6a8326df6ca	-	-	Yes	vpc-0a05290b928e585be   mattermost-vpc	684742223434	

Route Table: rtb-02325b6a8326df6ca			
Summary	Routes	Subnet Associations	Edge Associations
Edit routes			
View All routes			
Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
0.0.0.0/0	eni-0aedd466c755a0b93	active	No

## Screenshot 15:

Add route with destination 0.0.0.0/0 and target the NAT EC2 server on main route table which is assigned to private subnet. This is necessary to install the MySQL server on the EC2 instance on private subnet.

```

ec2-user@ip-10-0-1-21:~
login as: ec2-user
Authenticating with public key "imported-openssh-key"

  _ | _ | _ )
 _ | ( _ /   Amazon Linux 2 AMI
 _ | \ _ | _ |

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-0-1-21 ~]$
[ec2-user@ip-10-0-1-21 ~]$

```

## Screenshot 16:

Connect to Bastion EC2 server using Putty.

```

[root@ip-10-0-1-21 ec2-user]# cat private-key.pem
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEAnsVblFoWifAJ/Y2/oJLLPkFk4rbRmKxAM5t0ctwyJCpx55Nh
EtTl+qmsI7RY+jVlD/e4ef2ulgoVEbkvGlvK2cZ8iilJdW42gD+Sb42HfnRikuml
yHpyNkTtJIATZfwy5r4ZOJfZD7qQYSSszlYvqd7op8/tRJWIfkF2JeWpPJJQmnV
72crqrZv8SpgGeZMfStIWpggMF+drRRGGgf/qZi/HRu2fDc2gd40zoZBjbItpQ9T
ZJc3O7/vUHUqpiKYvSaUMExvLtFCIuPeeZK007GJUGGAnHFc26AQFDwNvIGCrSxc
9UjMfQmcvMYRE4nU8N4ePTB3AlQdlfUNDzqOfwIDAQABAoIBAQCSh3yc4DZRR42
tvhRlNtcgJxYPlhiH3IHQLrUHihJvOEiA9lIqnUUXBVRurIyL45Of8qFFa6uJw10
JBAh3SkTNpyMn8n0dFJzHk6dw9VjTvZ8inllGZbOCc6UWbuUGxCAqlpsMAxyuSAQ
aPE/Zevb8TgYCC+774KkS6DXmuNGWEEfwDl/520s2hQkf5+swQLnN8Wrh5gN0acW
fgWxIV8H35CoHZ/z5eel9jkNJ9CjN5Scpky+SOP7ZYQ+gKGCHlVt0PSkh65E7b0D
WveRf1+G5Fsgia0+hTL22bQb2gE6yybOBq1PSjpw7kFv/jTKBZiWB6Et60IG0IPn
ZCX5OYWhAoGBANS7meY5SKqYgJfzQhX4+Z/7+EWDFYg5sDRf9MxlxshFaTrPSE4
bZKRSRv2tuC4FmJg52ql4IdDM61sNiQLQGEmcO8O+e0cXI7nRbInJBG6olVudVqv
4km9T1ELyX9aAR4m3INujZKtDWOLuW56arslMFk1Qnlfc15rur21E7SrAoGBAL8Q
H0sycDQzFbEzwoWAp1lxwBdGHOhr96QiBtonlktCtnr41D6H16/AfBXDdp5PGnl
CvGj0c+mjMQdVRZiFo1UsSNGQmu8wwgx/6v1UhFiJHHAvaYp2kU54q2zINN1IMS3
3b0KaQYiyRMCbOzyk074YRKu5NRZ0YmGMYe+PAV9AoGBAMIJL5Hn1B1O7A+WtEw0
5oG7FhCnbK8uqWscas8wlwk8TeUuI6aQgdQkODZg9C4ejQX+QRER2aorVyBAZ0LRF
swQXs5DJhzs4EFCkMFUUEHk/U4w7CT2jifKagvtP776L+NMIvUAAmY882yZ+Lq/P
ZwTEugnFy4TRiEiKWLvqscOrAoGAZQCKmRcX07BxtjRrj5Gb3srQRjltSLw1bp2v
JfYfzs+N3ffiOkuPS9Hjn38VtrnCYy0D9Qup/YDJB1+OPH/rGi9cWQ5qTHQEEhAE
XY4ZLVFZfLzSRKv5VAEuwK5iGvzT38pnMOKQ7gpzilYL6RKvJt8MygiktVEqAO5s
vpq1Ni0CgYBMqcUx2UONyLcOP6K4Fk3Rzc9nCHN8yu2OzHC51I200c13jV9cc0Z
J+F3rN3F134RzlmihQ7noeans7bWGW72nBBHWlrV2mWd0RLIx2pTGFFhb6c7KTzV
Cv8zBlcUOcl8DdCWECL996njolpSGG+17NBkalaT+IajXU5+qHXmQ==
-----END RSA PRIVATE KEY-----
[root@ip-10-0-1-21 ec2-user]#
[root@ip-10-0-1-21 ec2-user]#
[root@ip-10-0-1-21 ec2-user]# ls
private-key.pem
[root@ip-10-0-1-21 ec2-user]#
[root@ip-10-0-1-21 ec2-user]# chmod 0600 private-key.pem
[root@ip-10-0-1-21 ec2-user]# ssh -i private-key.pem ec2-user@10.0.2.225
Authentication failed.
[root@ip-10-0-1-21 ec2-user]# ssh -i private-key.pem ubuntu@10.0.2.225
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 5.4.0-1029-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Sun Dec  6 18:25:43 UTC 2020

System load:  0.0                       Processes:           91
Usage of /:   14.5% of 7.69GB           Users logged in:    0
Memory usage: 17%                       IP address for eth0: 10.0.2.225
Swap usage:   0%

0 packages can be updated.
0 updates are security updates.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-2-225:~$
ubuntu@ip-10-0-2-225:~$
ubuntu@ip-10-0-2-225:~$

```

## Screenshot 17:

Connect to MySQL server with IP (10.0.2.225) on private subnet from Bastion EC2 server.

**NAT gateways (1/1)** [Info](#)

Filter NAT gateways

1

Name	NAT gateway ID	State	State message	Elastic IP address	Private IP address	Network interface ID	VPC
nat-gateway	nat-0875927ab75b90028	Available	-	54.87.89.193	10.0.1.95	eni-078d96248750576fd	vpc-0a05290b928e585be / m...

### Screenshot 18:

Because the solution with the EC2 server as NAT instance did not work and I cannot install the MySQL server on the EC2 machine on private subnet (no connectivity to the internet), I create a NAT gateway instead and everything works fine.

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

Filter by tags and attributes or search by keyword

1 to 3 of 3

Name	Route Table ID	Explicit subnet association	Edge associations	Main	VPC ID	Owner
public-route-table	rtb-6bd9d9a15	-	-	Yes	vpc-526d952f	684742223434
mainRouteTable	rtb-02325b6a8326df6ca	subnet-0b569cf3a991547d0	-	Yes	vpc-0a05290b928e585be   mattermost-vpc	684742223434

**Route Table: rtb-02325b6a8326df6ca**

Summary **Routes** Subnet Associations Edge Associations Route Propagation Tags

Edit routes

View All routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
0.0.0.0/0	nat-0875927ab75b90028	active	No

### Screenshot 19:

Update the entry on main route table which is assigned to private subnet in order to have the NAT gateway as target and not the NAT EC2 server instance.



```

Selecting previously unselected package mysql-server-5.7.
(Reading database ... 57258 files and directories currently installed.)
Preparing to unpack .../00-mysql-server-5.7_5.7.32-0ubuntu0.18.04.1_amd64.deb ...
Unpacking mysql-server-5.7 (5.7.32-0ubuntu0.18.04.1) ...
Selecting previously unselected package libhtml-tagset-perl.
Preparing to unpack .../01-libhtml-tagset-perl_3.20-3_all.deb ...
Unpacking libhtml-tagset-perl (3.20-3) ...
Selecting previously unselected package liburi-perl.
Preparing to unpack .../02-liburi-perl_1.73-1_all.deb ...
Unpacking liburi-perl (1.73-1) ...
Selecting previously unselected package libhtml-parser-perl.
Preparing to unpack .../03-libhtml-parser-perl_3.72-3build1_amd64.deb ...
Unpacking libhtml-parser-perl (3.72-3build1) ...
Selecting previously unselected package libcgi-pm-perl.
Preparing to unpack .../04-libcgi-pm-perl_4.38-1_all.deb ...
Unpacking libcgi-pm-perl (4.38-1) ...
Selecting previously unselected package libfcgi-perl.
Preparing to unpack .../05-libfcgi-perl_0.78-2build1_amd64.deb ...
Unpacking libfcgi-perl (0.78-2build1) ...
Selecting previously unselected package libcgi-fast-perl.
Preparing to unpack .../06-libcgi-fast-perl_1:2.13-1_all.deb ...
Unpacking libcgi-fast-perl (1:2.13-1) ...
Selecting previously unselected package libencode-locale-perl.
Preparing to unpack .../07-libencode-locale-perl_1.05-1_all.deb ...
Unpacking libencode-locale-perl (1.05-1) ...
Selecting previously unselected package libhtml-template-perl.
Preparing to unpack .../08-libhtml-template-perl_2.97-1_all.deb ...
Unpacking libhtml-template-perl (2.97-1) ...
Selecting previously unselected package libtimedate-perl.
Preparing to unpack .../09-libtimedate-perl_2.3000-2_all.deb ...
Unpacking libtimedate-perl (2.3000-2) ...
Selecting previously unselected package libhttp-date-perl.
Preparing to unpack .../10-libhttp-date-perl_6.02-1_all.deb ...
Unpacking libhttp-date-perl (6.02-1) ...
Selecting previously unselected package libio-html-perl.
Preparing to unpack .../11-libio-html-perl_1.001-1_all.deb ...
Unpacking libio-html-perl (1.001-1) ...
Selecting previously unselected package liblwp-mediatypes-perl.
Preparing to unpack .../12-liblwp-mediatypes-perl_6.02-1_all.deb ...
Unpacking liblwp-mediatypes-perl (6.02-1) ...
Selecting previously unselected package libhttp-message-perl.
Preparing to unpack .../13-libhttp-message-perl_6.14-1_all.deb ...
Unpacking libhttp-message-perl (6.14-1) ...
Selecting previously unselected package mysql-server.
Preparing to unpack .../14-mysql-server_5.7.32-0ubuntu0.18.04.1_all.deb ...
Unpacking mysql-server (5.7.32-0ubuntu0.18.04.1) ...
Setting up libhtml-tagset-perl (3.20-3) ...
Setting up libevent-core-2.1-6:amd64 (2.1.8-stable-4build1) ...
Setting up libencode-locale-perl (1.05-1) ...
Setting up libtimedate-perl (2.3000-2) ...
Setting up libio-html-perl (1.001-1) ...
Setting up liblwp-mediatypes-perl (6.02-1) ...
Setting up libaio1:amd64 (0.3.110-5ubuntu0.1) ...
Setting up liburi-perl (1.73-1) ...
Setting up libhtml-parser-perl (3.72-3build1) ...
Setting up libcgi-pm-perl (4.38-1) ...
Setting up mysql-client-core-5.7 (5.7.32-0ubuntu0.18.04.1) ...
Setting up libfcgi-perl (0.78-2build1) ...
Setting up libhttp-date-perl (6.02-1) ...
Setting up libhtml-template-perl (2.97-1) ...
Setting up mysql-server-core-5.7 (5.7.32-0ubuntu0.18.04.1) ...
Setting up libcgi-fast-perl (1:2.13-1) ...
Setting up libhttp-message-perl (6.14-1) ...
Setting up mysql-client-5.7 (5.7.32-0ubuntu0.18.04.1) ...
Setting up mysql-server-5.7 (5.7.32-0ubuntu0.18.04.1) ...
update-alternatives: using /etc/mysql/mysql.cnf to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Renaming removed key_buffer and myisam-recover options (if present)
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql.service.
Setting up mysql-server (5.7.32-0ubuntu0.18.04.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.2) ...
Processing triggers for systemd (237-3ubuntu1.0.42) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
ubuntu@ip-10-0-2-225:~$

```

## Screenshot 20:

MySQL database installed on EC2 server with IP 10.0.2.225 on private subnet.

```

All done!
ubuntu@ip-10-0-2-225:~$
ubuntu@ip-10-0-2-225:~$
ubuntu@ip-10-0-2-225:~$ sudo mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.32-0ubuntu0.18.04.1 (Ubuntu)

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Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create user 'mmuser'@'%' identified by 'mmuser-password';
Query OK, 0 rows affected (0.00 sec)

mysql> create database mattermost;
Query OK, 1 row affected (0.00 sec)

mysql> grant all privileges on mattermost.* to 'mmuser'@'%;
Query OK, 0 rows affected (0.00 sec)

mysql> exit
Bye
ubuntu@ip-10-0-2-225:~$ █

```

#### Screenshot 21:

Create user to MySQL database on private subnet

```

ubuntu@ip-10-0-1-167: ~
login as: ubuntu
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 5.4.0-1029-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Sun Dec  6 19:04:41 UTC 2020

System load:  0.08               Processes:           90
Usage of /:   14.6% of 7.69GB    Users logged in:    0
Memory usage: 17%               IP address for eth0: 10.0.1.167
Swap usage:   0%

0 packages can be updated.
0 updates are security updates.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-1-167:~$
ubuntu@ip-10-0-1-167:~$
ubuntu@ip-10-0-1-167:~$ █

```

#### Screenshot 21:

Connect to Mattermost EC2 instance on public subnet (IP 10.0.1.167) using Putty.

```
},
"SqlSettings": {
  "DriverName": "mysql",
  "DataSource": "mmuser:mmuser-password@tcp(10.0.2.225:3306)/mattermost?charset=utf8mb4,utf8\u0026readTimeout=30s\u0026writeTimeout=30s",
  "DataSourceReplicas": [],
  "DataSourceSearchReplicas": [],
  "MaxIdleConns": 20,
  "ConnMaxLifetimeMilliseconds": 3600000,
  "MaxOpenConns": 300,
  "Trace": false,
  "AtRestEncryptKey": "krwi67cbqwgwg8jkfcj3dShipt6w7jxf",
  "QueryTimeout": 30,
  "DisableDatabaseSearch": false
},
"LogSettings": {
  "EnableConsole": true,
  "ConsoleLevel": "INFO",
```

## Screenshot 22:

Configure MySQL connection properties on "/opt/mattermost/config/config.json" file on Mattermost EC2 instance.

```
ubuntu@ip-10-0-1-167:/opt/mattermost$ sudo -u mattermost ./bin/mattermost
[*level="info",*ts="1607204220.444066",*caller="app/server.go:219",*msg="Server is initializing..."]
[*level="info",*ts="1607204220.444016",*caller="app/web_hmh.go:19",*msg="Starting webserver hmh",*number_of_hmh=2]
[*level="warn",*ts="1607204220.444743",*caller="app/server.go:223",*msg="Security reporting is enabled, but SECURITY_RSS is not set. Disabling reporting."]
[*level="info",*ts="1607204220.448142",*caller="utils/libn.go:90",*msg="Loaded system translations",*for_locale="en",*from_locale="/opt/mattermost/libn/en.json"]
[*level="info",*ts="1607204220.455941",*caller="postgres/supplier.go:235",*msg="Pinging SQL",*database="matter"]
[*level="info",*ts="1607204221.488117",*caller="postgres/upgrade.go:111",*msg="The database schema version has been set",*version="5.25.0"]
[*level="info",*ts="1607204224.400956",*caller="app/license.go:154",*msg="License key from https://mattermost.com required to unlock enterprise features."]
[*level="error",*ts="1607204224.432224",*caller="app/server.go:414",*msg="Mail server connection test is failed: SendMailNotifications is not true"]
[*level="info",*ts="1607204224.432303",*caller="app/server.go:450",*msg="Current version is 5.25.0 (5.25.1/Thu Dec 3 18:13:13 UTC 2020/35e4d86c206ec083cb5b05d598506ce3od/610643dbcb0b7765a0f0daef91f24a8dc6479e0c)",*current_version="5.25.0",*build_number="5.25.1",*build_date="Thu Dec 3 18:13:13 UTC 20",*build_hash="35e4d86c206ec083cb5b05d598506ce3od3",*build_hash_enterprise="610643dbcb0b7765a0f0daef91f24a8dc6479e0c"]
[*level="info",*ts="1607204224.432637",*caller="app/server.go:459",*msg="Enterprise Build",*enterprise_build="true"]
[*level="info",*ts="1607204224.432756",*caller="app/server.go:469",*msg="Pinning console voicing",*file="https://opt/mattermost"]
[*level="info",*ts="1607204224.432848",*caller="app/server.go:469",*msg="Loading config",*source="file:///opt/mattermost/config/config.json"]
[*level="info",*ts="1607204224.461872",*caller="postgres/post_store.go:168",*msg="PostMessage has size restrictions",*max_characters="14383",*max_bytes="65535"]
[*level="info",*ts="1607204224.521602",*caller="hiveengine/hive.go:267",*msg="UpdateConf Blene"]
[*level="info",*ts="1607204224.573214",*caller="app/server.go:878",*msg="Starting Server..."]
[*level="info",*ts="1607204224.573245",*caller="app/server.go:855",*msg="Server is listening on [::]:8065",*address="[::]:8065"]
```

## Screenshot 23:

By running "sudo -u mattermost ./bin/mattermost" command on Mattermost EC2 instance, Mattermost application runs without any problems and the server is listening on port 8065.

EC2 > Security Groups > sg-0a677d949260d288e - launch-wizard-3

## sg-0a677d949260d288e - launch-wizard-3

Actions

### Details

Security group name

launch-wizard-3

Security group ID

sg-0a677d949260d288e

Description

launch-wizard-3 created 2020-12-06T19:46:01.526+02:00

VPC ID

vpc-0a05290b528e585be

Owner

684742223434

Inbound rules count

5 Permission entries

Outbound rules count

1 Permission entry

Inbound rules

Outbound rules

Tags

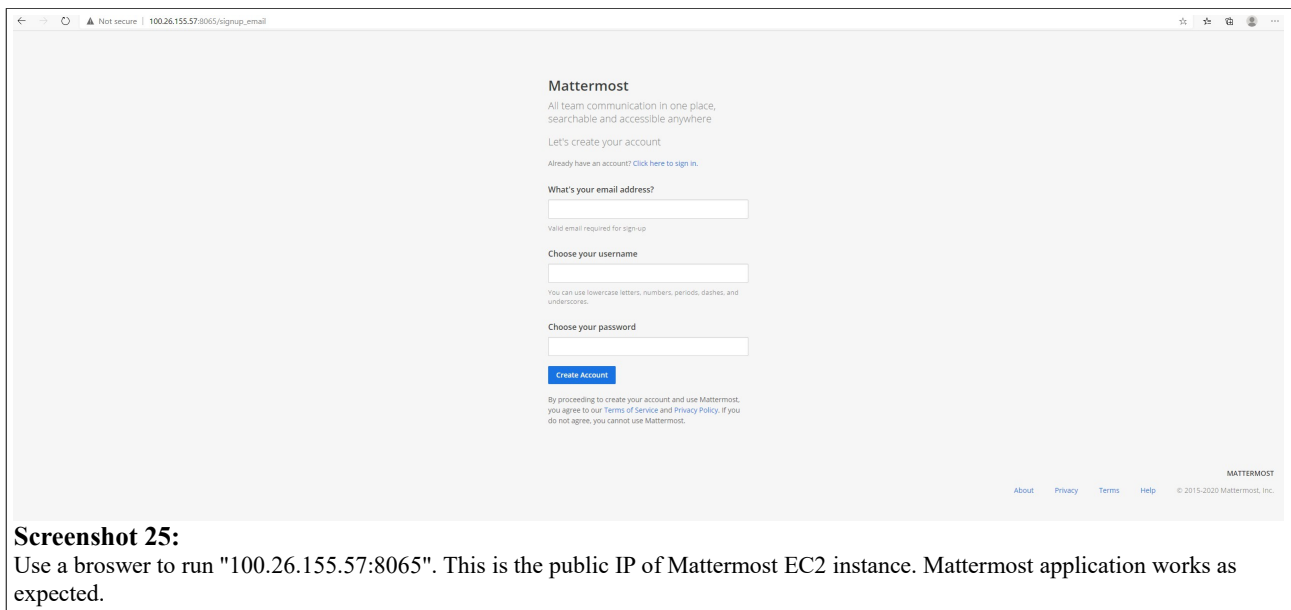
### Inbound rules

Edit inbound rules

Type	Protocol	Port range	Source	Description - optional
HTTP	TCP	80	0.0.0.0/0	-
HTTP	TCP	80	::/0	-
SSH	TCP	22	37.6.0.1/32	-
Custom TCP	TCP	8065	0.0.0.0/0	-
Custom TCP	TCP	8065	::/0	-

## Screenshot 24:

Add an inbound rule on Mattermost EC2 instance in order to receive TCP traffic from the internet on port 8065.



**Screenshot 25:**

Use a browser to run "100.26.155.57:8065". This is the public IP of Mattermost EC2 instance. Mattermost application works as expected.