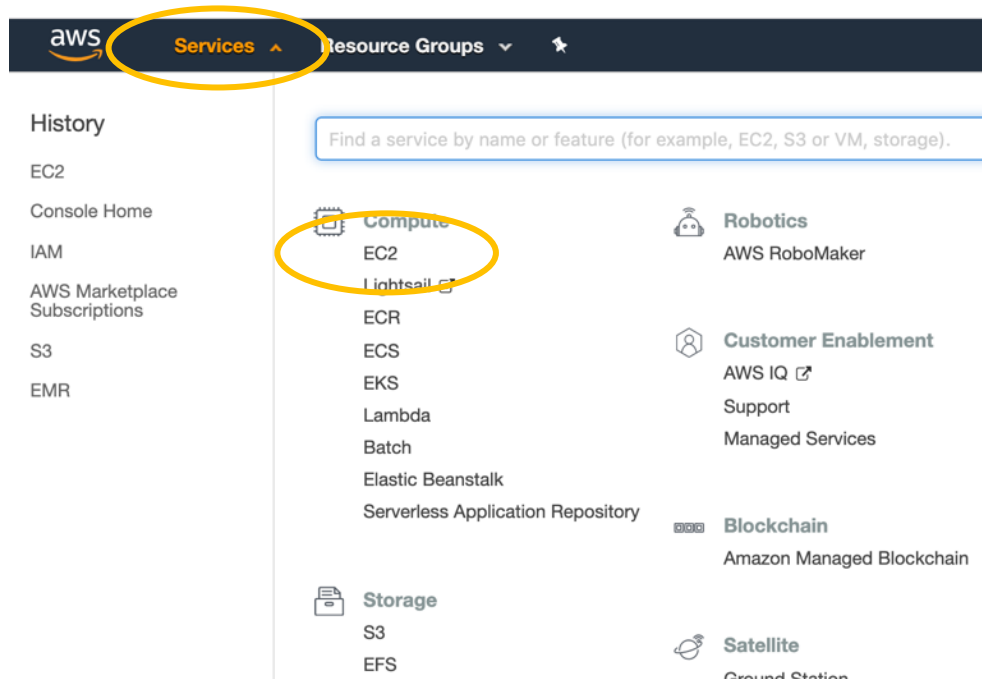


Instructions for Installing and Configuring a Single Node MongoDB Database

The MongoDB database is installed and configured for production use onto a cluster of several virtual machines. For exploring the use of this technology on a small scale, however, it is possible to set it up to execute on a single virtual machine which is what these instructions describe. The installation proceeds in two phases: create a virtual machine and then install and start MongoDB.

Section 1: Instructions for setting up an EC2 instance (virtual machine)

- 1) Select “Services” on the AWS console. Then select “EC2”



2) Launch a new EC2 instance by clicking on “Launch Instance”

The screenshot shows the AWS Management Console's EC2 Dashboard. On the left, a navigation menu lists various EC2-related features. The main content area displays resource counts for the US East (N. Virginia) region and a 'Launch Instance' button, which is circled in yellow. Below the button, there is a note about the default region and a 'Service Health' section.

EC2 Dashboard

- Events
- Tags
- Reports
- Limits
- INSTANCES
 - Instances
 - Launch Templates
 - Spot Requests
 - Reserved Instances
 - Dedicated Hosts
 - Scheduled Instances
 - Capacity Reservations
- IMAGES
 - AMIs
 - Bundle Tasks
- ELASTIC BLOCK STORE
 - Volumes
 - Snapshots

Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) region:

- 0 Running Instances
- 0 Dedicated Hosts
- 0 Volumes
- 2 Key Pairs
- 0 Placement Groups

Learn more about the latest in AWS Compute from AWS re:Invent by viewing the

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US East (N. Virginia) region

Service Health

Service Status: US East (N. Vir

3) Select the Ubuntu 18.04 Amazon Machine Image (AMI)

The screenshot shows the 'Amazon Machine Image (AMI)' selection page. It lists several AMIs, including SUSE Linux Enterprise Server 15 SP1 and Ubuntu Server 18.04 LTS. The Ubuntu Server 18.04 LTS AMI is circled in yellow. Below the AMI list, there is a promotional banner for Amazon RDS.

Amazon Machine Image (AMI)

Cancel and Exit

SUSE Linux

Free tier eligible

SUSE Linux Enterprise Server 15 SP1 (HVM), SSD Volume Type - ami-0547b1fd62b28a111 (64-bit x86) / ami-008a07c569b8da5ca (64-bit Arm)

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-04b9e92b5572fa0d1 (64-bit x86) / ami-0bba96c31d87e65d9 (64-bit Arm)

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 ENA Enabled: Yes

Are you launching a database instance? Try Amazon RDS.

Amazon Relational Database Service (RDS) makes it easy to set up, operate, and scale your database on AWS by automating time-consuming database management tasks. With RDS, you can easily deploy **Amazon Aurora**, **MariaDB**, **MySQL**, **Oracle**, **PostgreSQL**, and **SQL Server** databases on AWS. **Aurora** is a MySQL- and PostgreSQL-compatible, enterprise-class database at 1/10th the cost of commercial databases. [Learn more about RDS](#)

Launch a database using RDS

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-04763b3055de4860b (64-bit x86) / ami-02ca3cadbc293e21 (64-bit Arm)

Select an instance (VM) type of m4.xlarge

Step 2: Choose an Instance Type

<input type="checkbox"/>	General purpose	m5.4xlarge	16	64	EBS only	Yes	Up to 10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.8xlarge	32	128	EBS only	Yes	10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.12xlarge	48	192	EBS only	Yes	10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.16xlarge	64	256	EBS only	Yes	20 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.24xlarge	96	384	EBS only	Yes	25 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.metal	96	384	EBS only	Yes	25 Gigabit	Yes
<input type="checkbox"/>	General purpose	m4.xlarge	2	8	EBS only	Yes	Moderate	Yes
<input type="checkbox"/>	General purpose	m4.2xlarge	4	16	EBS only	Yes	High	Yes
<input type="checkbox"/>	General purpose	m4.4xlarge	8	32	EBS only	Yes	High	Yes
<input type="checkbox"/>	General purpose	m4.8xlarge	16	64	EBS only	Yes	High	Yes
<input type="checkbox"/>	General purpose	m4.10xlarge	40	160	EBS only	Yes	10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m4.16xlarge	64	256	EBS only	Yes	25 Gigabit	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

4) Select “Next: Configure Instance Details”

Step 2: Choose an Instance Type

<input type="checkbox"/>	General purpose	m5.4xlarge	16	64	EBS only	Yes	Up to 10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.8xlarge	32	128	EBS only	Yes	10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.12xlarge	48	192	EBS only	Yes	10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.16xlarge	64	256	EBS only	Yes	20 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.24xlarge	96	384	EBS only	Yes	25 Gigabit	Yes
<input type="checkbox"/>	General purpose	m5.metal	96	384	EBS only	Yes	25 Gigabit	Yes
<input type="checkbox"/>	General purpose	m4.xlarge	2	8	EBS only	Yes	Moderate	Yes
<input type="checkbox"/>	General purpose	m4.2xlarge	4	16	EBS only	Yes	High	Yes
<input type="checkbox"/>	General purpose	m4.4xlarge	8	32	EBS only	Yes	High	Yes
<input type="checkbox"/>	General purpose	m4.8xlarge	16	64	EBS only	Yes	High	Yes
<input type="checkbox"/>	General purpose	m4.10xlarge	40	160	EBS only	Yes	10 Gigabit	Yes
<input type="checkbox"/>	General purpose	m4.16xlarge	64	256	EBS only	Yes	25 Gigabit	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

5) Select “Next: Add Storage”

Step 3: Configure Instance Details

Purchasing option ⓘ ☐ Request Spot instances

Network ⓘ vpc-b02c12d7 (default) [Create new VPC](#)

Subnet ⓘ No preference (default subnet in any Availability Zone) [Create new subnet](#)

Auto-assign Public IP ⓘ Use subnet setting (Enable)

Placement group ⓘ ☐ Add instance to placement group

Capacity Reservation ⓘ Open [Create new Capacity Reservation](#)

IAM role ⓘ None [Create new IAM role](#)

CPU options ⓘ ☐ Specify CPU options

Shutdown behavior ⓘ Stop

Enable termination protection ⓘ ☐ Protect against accidental termination

Monitoring ⓘ ☐ Enable CloudWatch detailed monitoring
[Additional charges apply.](#)

EBS-optimized instance ⓘ ☒ Launch as EBS-optimized instance

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

6) Change the root storage size from 8 GiB to 32 GiB. Then select “Review and Launch”

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encryption ⓘ
Root	/dev/sda1	snap-02e105f837cd927	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

[Add New Volume](#)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Tags](#)

7 Now “Launch” the instance

Step 7: Review Instance Launch

eligible Root Device Type: ebs Virtualization type: hvm

▼ Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t3a.xlarge	Variable	4	16	EBS only	Yes	Up to 5 Gigabit

▼ Security Groups [Edit security groups](#)

Security group name: launch-wizard-2
Description: launch-wizard-2 created 2019-10-23T13:12:36.320-05:00

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
This security group has no rules				

▶ Instance Details [Edit instance details](#)

▶ Storage [Edit storage](#)

[Cancel](#) [Previous](#) [Launch](#)

- 8) Select an existing key pair (or create a new pair). You can use the same key pair you created for your EMR instances. Make sure to check the “I acknowledge...” checkbox.

Step 7: Review Instance Launch

eligible Root Device Type: ebs Virtualization type: hvm

▼ Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs
t3a.xlarge	Variable	4

▼ Security Groups [Edit security groups](#)

Security group name: launch-wizard-2
Description: launch-wizard-2 created 2019-10-23T13:12:36.320-05:00

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
This security group has no rules				

▶ Instance Details [Edit instance details](#)

▶ Storage [Edit storage](#)

[Cancel](#) [Previous](#) [Launch](#)

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Choose an existing key pair

Select a key pair

emr-key-pair

☐ I acknowledge that I have access to the selected private key file (emr-key-pair.pem), and that without this file, I won't be able to log into my instance.

[Cancel](#) [Launch Instances](#)

9) You should see this. Select “View Instances”

Launch Status

The following instance launches have been initiated: [i-03dd5eb8288beffca](#) [View launch log](#)

Get notified of estimated charges
Create [billing alerts](#) to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instances

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click **View Instances** to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. [Find out](#) how to connect to your instances.

▼ Here are some helpful resources to get you started

- [How to connect to your Linux instance](#)
- [Amazon EC2: User Guide](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: Discussion Forum](#)

While your instances are launching you can also

- [Create status check alarms](#) to be notified when these instances fail status checks. (Additional charges may apply)
- [Create and attach additional EBS volumes](#) (Additional charges may apply)
- [Manage security groups](#)

[View Instances](#)

10) Wait until the instance state is “running”. Note that the public address (Public DNS) is provided for use in connecting via ssh or scp to the instance.

The screenshot displays the AWS Management Console interface for EC2 instances. At the top, the 'Instances (1/1)' header is visible, along with a search bar and navigation buttons. Below this, a table lists the instance details. The instance 'i-0cd09ced887163580' is shown with a status of 'Running', which is circled in yellow. The instance type is 'm4.xlarge' and it is located in the 'us-east-1e' availability zone. Below the table, the 'Instance: i-0cd09ced887163580' details page is open, showing various tabs like 'Details', 'Security', 'Networking', etc. The 'Instance summary' section is expanded, showing the 'Instance ID' as 'i-0cd09ced887163580' and the 'Instance state' as 'Running'. The 'Public IPv4 address' is listed as '3.84.239.148', which is also circled in yellow, along with a link to 'open address'. Other details include 'Private IPv4 addresses' (172.31.41.27), 'Public IPv4 DNS' (ec2-3-84-239-148.compute-1.amazonaws.com), and 'Private IPv4 DNS' (ip-172-31-41-27.ec2.internal).

Name	Instance ID	Instance state	Instance type	Status check	Alarm Status	Availability zone
-	i-0cd09ced887163580	Running	m4.xlarge	2/2 checks ...	No alarms +	us-east-1e

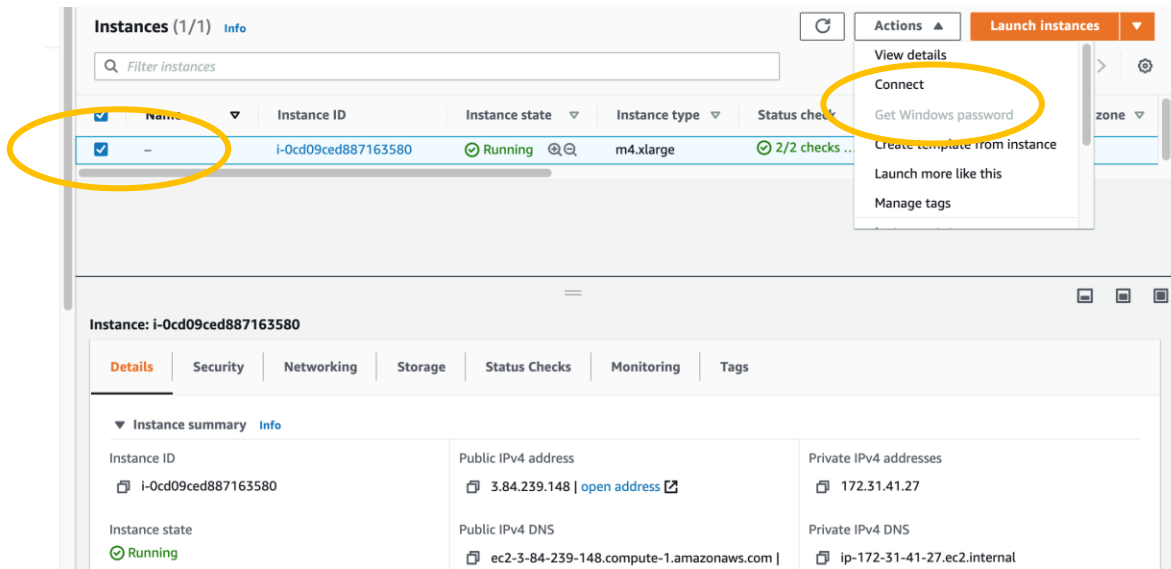
Instance: i-0cd09ced887163580

Instance summary

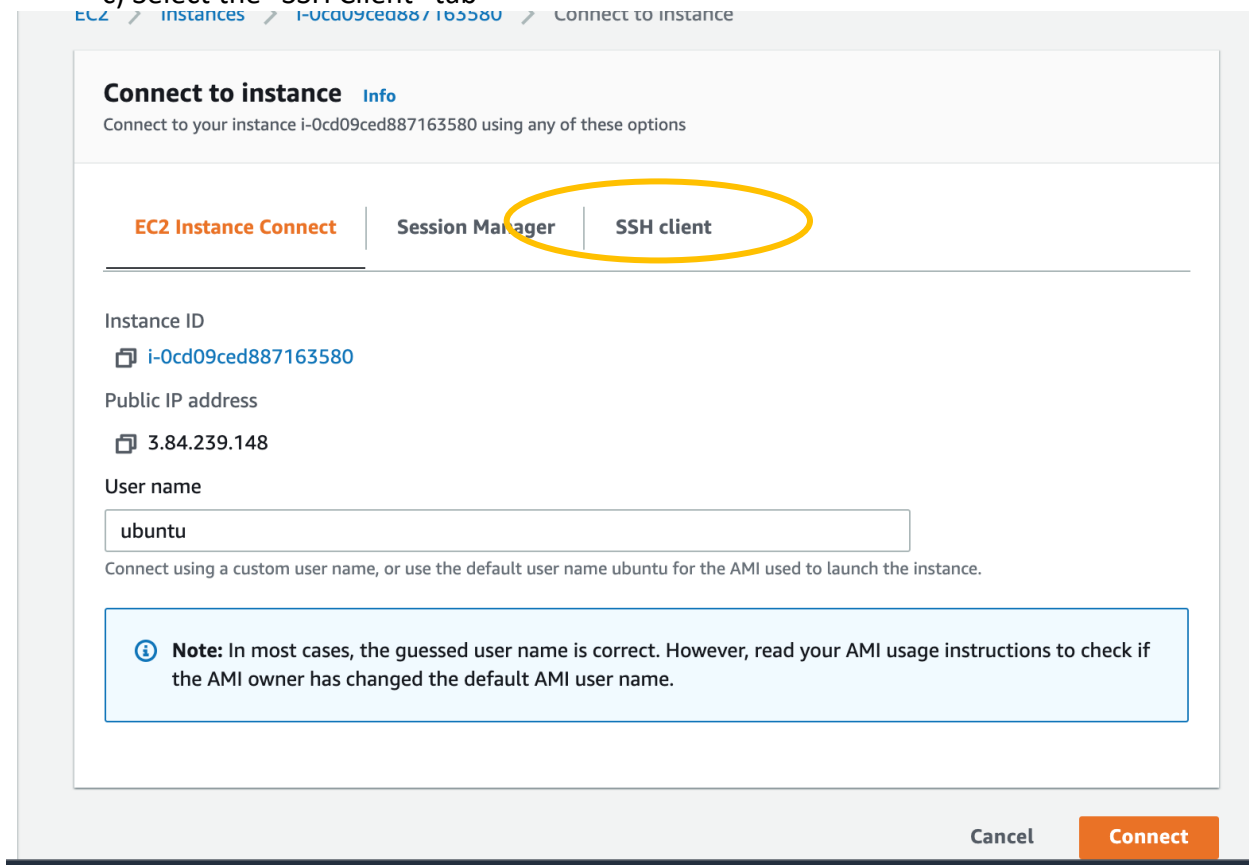
Instance ID	Public IPv4 address	Private IPv4 addresses
i-0cd09ced887163580	3.84.239.148 open address	172.31.41.27
Instance state	Public IPv4 DNS	Private IPv4 DNS
Running	ec2-3-84-239-148.compute-1.amazonaws.com	ip-172-31-41-27.ec2.internal

10 Now you can ssh to the instance the easy way as follows.

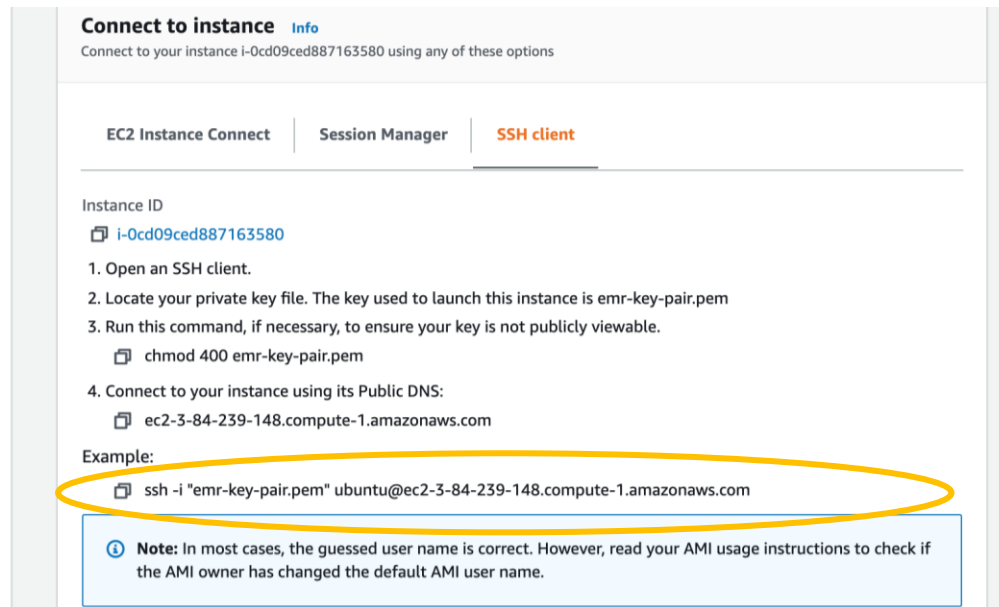
- Make sure you check the EC2 instance
- Click on the “Connect” button.



c) Select the “SSH Client” tab



d) Cut and paste the example ssh command that appears into your terminal to connect to your instance



Connect to instance [Info](#)
Connect to your instance i-0cd09ced887163580 using any of these options

EC2 Instance Connect | Session Manager | **SSH client**

Instance ID
i-0cd09ced887163580

1. Open an SSH client.
2. Locate your private key file. The key used to launch this instance is emr-key-pair.pem
3. Run this command, if necessary, to ensure your key is not publicly viewable.
`chmod 400 emr-key-pair.pem`
4. Connect to your instance using its Public DNS:
`ec2-3-84-239-148.compute-1.amazonaws.com`

Example:
`ssh -i "emr-key-pair.pem" ubuntu@ec2-3-84-239-148.compute-1.amazonaws.com`

Note: In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

Note that in this case the user name of your account is “ubuntu” and the address of your instance <Public DNS (IPv4)> is also used. So the ssh command about is built as follows. Note <Public DNS (IPv4)> is replaced with the actual value listed in the previously shown instance information pane.

11) Now you can ssh to the instance as follows.

```
ssh -i emr-key-pair.pem ubuntu@<Public DNS (IPv4)>
```

Section 2: Instructions for installing MongoDB

- 1) Run the below command to Import the MongoDB repository public key used by the Ubuntu package management system. The operation should respond with an OK:

```
wget -qO - https://www.mongodb.org/static/pgp/server-4.2.asc | sudo apt-key add -
```

- 2) Add the repository of MongoDB to /etc/apt/sources.list.d/ mongodb-org-4.2.list, for example for the latest 4.2 version. Note, the following is all one line:

```
echo "deb [ arch=amd64 ] https://repo.mongodb.org/apt/ubuntu bionic/mongodb-org/4.2 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-4.2.list
```

- 3) Update the repositories:

```
sudo apt-get update
```

- 4) Install MongoDB (this might take a while):

```
sudo apt-get install -y mongodb-org
```

- 5) You can start MongoDB with

```
sudo service mongod start
```

- 6) You can start the MongoDB Shell with the following. Enter this to do the assignment exercises:

```
mongo
```

- 7) In case you want to stop your MongoDB instance from running (not likely for our exercises) you can do so with:

```
sudo service mongod stop
```