

## AWS Cassandra Setup:

### Steps to Create Instance:

Choose **Launch Instance**.

**Step 1: Choose an Amazon Machine Image (AMI)**, find Ubuntu Server at the top of the list and choose **Select**.

Step 1: Choose an Amazon Machine Image (AMI)

☐ Free tier only ⓘ

AMI	Description	Root device type	Virtualization type	Architecture
Red Hat	Red Hat Enterprise Linux version 7.3 (HVM), EBS General Purpose (SSD) Volume Type	ebs	hvm	64-bit
SUSE Linux	SUSE Linux Enterprise Server 12 Service Pack 2 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.	ebs	hvm	64-bit
Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-a58d0dc5	Ubuntu Server 16.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).	ebs	hvm	64-bit
Microsoft Windows Server 2016 Base - ami-6e833e0e	Microsoft Windows 2016 Datacenter edition. [English]	ebs	hvm	64-bit

**Step 2: Choose an Instance Type**, choose **Next: Configure Instance Details**  
We selected t2.large.

Step 2: Choose an Instance Type

Currently selected: t2.large (Variable ECUs, 2 vCPUs, 2.4 GHz, Intel Xeon Family, 8 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.micro	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

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

**Step 3: Configure Instance Details**, choose **Network**, and then choose the entry for your default VPC.

The screenshot shows the AWS Management Console interface for configuring an EC2 instance. The top navigation bar includes 'Services', 'Resource Groups', and user information. The breadcrumb trail indicates the current step is '3. Configure Instance'.

**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 the lower pricing, assign an access management role to the instance, and more.

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

**Purchasing option** ☐ Request Spot instances

**Network**  [Create new VPC](#)

**Subnet**  [Create new subnet](#)

**Auto-assign Public IP**

**IAM role**  [Create new IAM role](#)

**Shutdown behavior**

**Enable termination protection** ☐ Protect against accidental termination

**Monitoring** ☐ Enable CloudWatch detailed monitoring

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

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**Step 4:** For storage, we add **30GB**

Services

Resource Groups

Bhanu

Oregon

Support

1. Choose AMI

2. Choose Instance Type

3. Configure Instance

4. Add Storage

5. Add Tags

6. Configure Security Group

7. Review

### 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	Encrypted
Root	/dev/sda1	snap-090acef382b239622	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.

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Next: Add Tags

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## Step 5: Add tags

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1. Choose AMI

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### Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)
Name	

Add another tag (Up to 50 tags maximum)

Cancel

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Next: Configure Security Group

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## Step 6: Choose Next: Configure Security Group.

In this we opened all the inbound/outbound traffic by creating a new rule for All Traffic and accepting Source IP from anywhere.

Services

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1. Choose AMI

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## Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group  
☐ Select an existing security group

Security group name:

Description:

Type	Protocol	Port Range	Source
SSH	TCP	22	Anywhere 0.0.0.0/0, ::/0
All traffic	All	0 - 65535	Anywhere 0.0.0.0/0, ::/0

Add Rule

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## Step 7: Choose launch.

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1. Choose AMI

2. Choose Instance Type

3. Configure Instance

4. Add Storage

5. Add Tags

6. Configure Security Group

7. Review

## 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.

Improve your instances' security. Your security group, launch-wizard-1, is open to the world.

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.

You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

Your instance configuration is not eligible for the free usage tier

To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices. [Learn more about free usage tier eligibility and usage restrictions.](#)

Don't show me this again

AMI Details

Free tier eligible

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-a58d0dc5

Ubuntu Server 16.04 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

Edit AMI

Instance Type

Edit instance type

Cancel

Previous

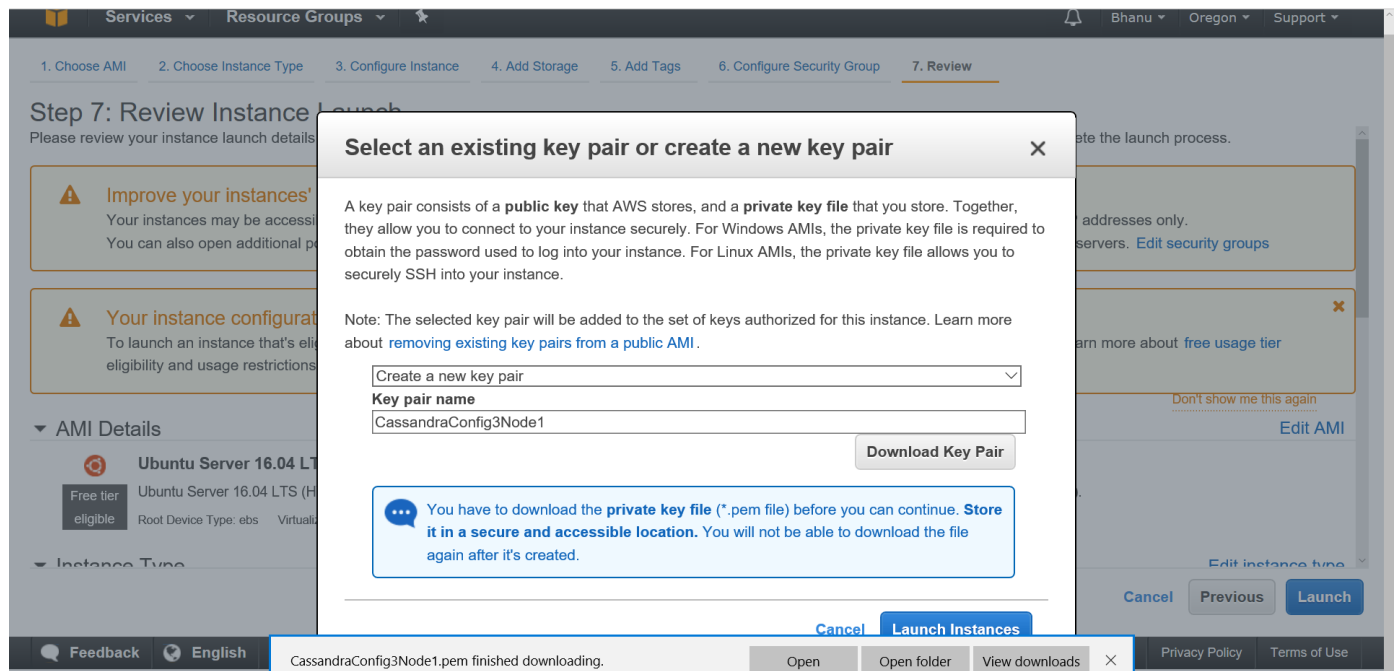
Launch

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Create a new key pair and download it to your local desktop.



### Connecting to EC2 Instance:

After creating of Ec2 instance, connect to it using Putty.

Before connecting using Putty, generate Private key using Putty Key Generator.

#### **Steps for creating Private Key:**

- Open Putty Key Generator.
- Click on conversions.
- Click on import
- Select the Key(.pem) created in AWS console.
- Click on save private key.



# PuTTY Key Generator



File Key Conversions Help

## Key

Public key for pasting into OpenSSH authorized\_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDpSHXbzOIHr79SUesVnnXv5LvP9LxN50iCDw97
DDOMLdjzXlyL6pyW7WvRZxjmoDgMRn6TA2XpmvfGaq3cyoNDdxARr9VlvDoo8ZMuzCYI/rF
wOrLj3fdDmOP4KCUH8zticeEKzMbnNGhhM5w1DaqR4EMxxALvVg
+lbsw/wnuunBhqwxYcBu3ksKXnLt5EQ81ZjRrFI42iSYBcNo2StHH1GmUydS2U3QuRKz0oyJs
```

Key fingerprint:

ssh-rsa 2048 9a:a6:5a:3f:55:e8:2f:3c:04:ea:74:3e:a4:bb:3b:1d

Key comment:

imported-openssh-key

Key passphrase:

Confirm passphrase:

## Actions

Generate a public/private key pair

Generate

Load an existing private key file

Load

Save the generated key

Save public key

Save private key

## Parameters

Type of key to generate:

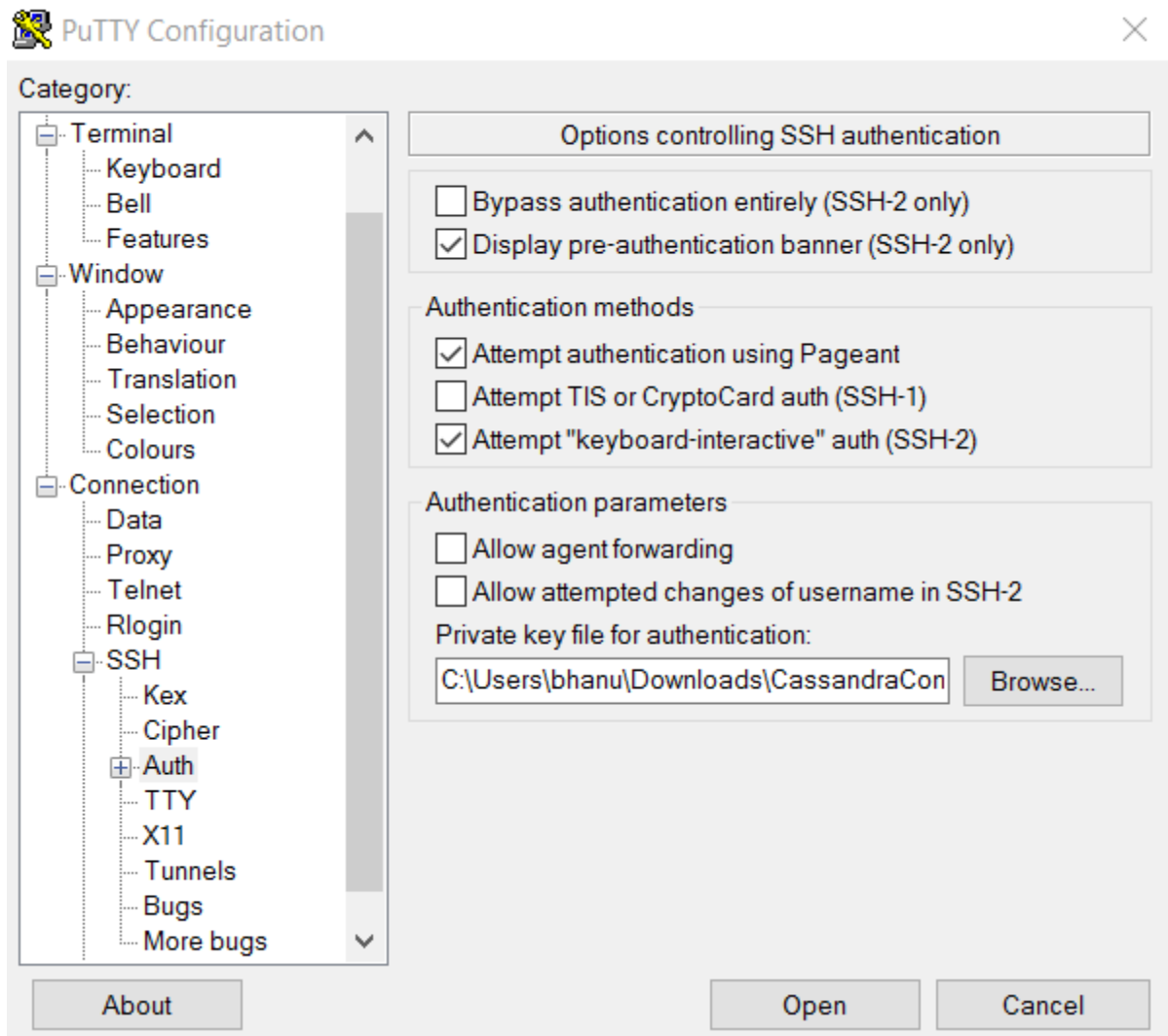
☐ SSH-1 (RSA)

☒ SSH-2 RSA

☐ SSH-2 DSA

Number of bits in a generated key:

2048



### Logging in Putty:

- Open Putty.
- Enter the Public IP of Ec2 Instance in hostname.
- Click on Auth
- Browse the Private Key
- Click on Data under connections and enter the auto login username as ubuntu
- Click on Open

```
ubuntu@ip-172-31-1-158: ~  
  
Get cloud support with Ubuntu Advantage Cloud Guest:  
http://www.ubuntu.com/business/services/cloud  
  
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-172-31-1-158:~$ sudo passwd root  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
ubuntu@ip-172-31-1-158:~$
```

## Making Instances Communicate:

In the listen address mention the IP Address of all the Cassandra nodes so that they form one cluster.

```
root@ip-172-31-1-158: /etc/cassandra  
GNU nano 2.5.3 File: cassandra.yaml Modified  
  
commitlog_segment_size_in_mb: 32  
  
# any class that implements the SeedProvider interface and has a  
# constructor that takes a Map<String, String> of parameters will do.  
seed_provider:  
  # Addresses of hosts that are deemed contact points.  
  # Cassandra nodes use this list of hosts to find each other and learn  
  # the topology of the ring. You must change this if you are running  
  # multiple nodes!  
  - class_name: org.apache.cassandra.locator.SimpleSeedProvider  
    parameters:  
      # seeds is actually a comma-delimited list of addresses.  
      # Ex: "<ip1>,<ip2>,<ip3>"  
      - seeds: "172.31.1.158,172.31.3.58,172.31.1.122"  
  
# For workloads with more data than can fit in memory, Cassandra's  
# bottleneck will be reads that need to fetch data from  
# disk. "concurrent_reads" should be set to (16 * number of drives) in  
# order to allow the operations to enqueue low enough in the stack  
# that the OS and drives can reorder them. Same applies to  
# "concurrent_counter_writes", since counter writes read the current  
# values before incrementing and writing them back.  
#  
# On the other hand, since writes are almost never IO bound, the ideal  
# number of "concurrent_writes" is dependent on the number of cores in  
# your system; (8 * number_of_cores) is a good rule of thumb.  
concurrent_reads: 32  
concurrent_writes: 32  
concurrent_counter_writes: 32  
  
# Total memory to use for sstable-reading buffers. Defaults to  
# the smaller of 1/4 of heap or 512MB.  
# file_cache_size_in_mb: 512  
  
# Total permitted memory to use for memtables. Cassandra will stop  
# accepting writes when the limit is exceeded until a flush completes,  
# and will trigger a flush based on memtable cleanup threshold  
# If omitted, Cassandra will set both to 1/4 the size of the heap.  
# memtable_heap_space_in_mb: 2048  
# memtable_offheap_space_in_mb: 2048  
  
# Ratio of occupied non-flushing memtable size to total permitted size  
# that will trigger a flush of the largest memtable. Larger mct will  
# mean larger flushes and hence less compaction, but also less concurrent  
# flush activity which can make it difficult to keep your disks fed
```



Snapshot of Cassandra Cluster with 6 nodes:

```
root@ip-172-31-15-207:/bin# nodetool -h localhost status
Datacenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address            Load            Tokens   Owns (effective)  Host ID
UN 172.31.15.207      87.77 KB        256      46.9%             287a3ee8-e43d-4f3b-9aac-83c856ad7ef8 rack1
UN 172.31.2.254       218.28 KB       256      49.4%             4f8aed2e-22f4-49f7-bd69-daa67672ff81 rack1
UN 172.31.15.152     89.95 KB        256      48.3%             a0c44198-0bb6-45d8-b1a4-07d4f4cf09a1 rack1
UN 172.31.6.227       70.41 KB        256      50.2%             efe877d0-3189-46ab-9a5c-34dcf17bf3bc rack1
UN 172.31.1.178       53.14 KB        256      52.2%             a488a948-91ce-4758-a35f-6c0922f4cfe9 rack1
UN 172.31.8.240       70.4 KB         256      52.9%             f4a6e0f5-b607-4b3d-a373-a09259a21c7d rack1
```

In Security Groups open the inbound/outbound traffic.

Services ▾ Resource Groups ▾

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

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Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name:

Description:

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ
SSH	TCP	22	Anywhere 0.0.0.0/0, ::/0
All traffic	All	0 - 65535	Anywhere 0.0.0.0/0, ::/0

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VM Instance Specification:

Instance /CPU Type: t2.large

Number of Cores: 2

**Memory Size: 30GB/dev/sda1**

**Price:** CPU credits/hours: 36 \$0.094 per hour

Description	Status Checks	Monitoring	Tags		
	Instance ID	i-0700186a818924820		Public DNS (IPv4)	-
	Instance state	stopped		IPv4 Public IP	-
	Instance type	t2.large		IPv6 IPs	-
	Elastic IPs			Private DNS	ip-172-31-3-58.us-west-2.compute.internal
	Availability zone	us-west-2c		Private IPs	172.31.3.58
	Security groups	launch-wizard-3. <a href="#">view inbound rules</a>		Secondary private IPs	
	Scheduled events	-		VPC ID	vpc-96126df1
	AMI ID	ubuntu/images/hvm-ssd/ubuntu-xenial-16.04-amd64-server-20170221 (ami-a58d0dc5)		Subnet ID	subnet-d85d5180
	Platform	-		Network interfaces	eth0
	IAM role	-		Source/dest. check	True
	Key pair name	CassandraConfig3Node3			
	Owner	539628028430		FRS-optimized	False
	Launch time	March 11, 2017 at 3:56:56 PM UTC-6 (9 hours)		Root device type	efs
	Termination protection	False		Root device	<a href="#">/dev/sda1</a>
	Lifecycle	normal		Block devices	<a href="#">/dev/sda1</a>
	Monitoring	basic			
	Alarm status	None			
	Kernel ID	-			
	RAM disk ID	-			
	Placement group	-			
	Virtualization	hvm			
	Reservation	r-0a56f120811b85e1e			
	AMI launch index	0			
	Tenancy	default			
	Host ID	-			
	Affinity	-			
	State transition reason	User initiated (2017-03-11 22:52:02)			

## Issues Faced:

### Issue 1:

Was unable to download Cassandra from the link provided in blog.

### Solution 1:

Downloaded a newer version of Cassandra and got it running.

### Issue 2:

Removing nodes on local host was time consuming and slow.

### Solution 2:

Used command **nodetool removenode force hostID**

