

Experiment 12

Roll No.	70
Name	MAYURI SHRIDATTA YERANDE
Class	D15-B
Subject	DevOps Lab
LO Mapped	<p>LO1: To understand the fundamentals of DevOps engineering and be fully proficient with DevOps terminologies, concepts, benefits, and deployment options to meet your business requirements</p> <p>LO2: To obtain complete knowledge of the “version control system” to effectively track changes augmented with Git and GitHub</p>

Aim: To install and Configure Pull based Software Configuration Management and provisioning tools using Puppet.

Theory:

What is Configuration Management?

Configuration management is the process of maintaining software and computer systems (for example servers, storage, networks) in a known, desired and consistent state. It also allows access to an accurate historical record of system state for project management and audit purposes. System Administrators mostly perform repetitive tasks like installing servers, configuring those servers, etc. These professionals can automate this task, by writing scripts. However, it is a difficult job when they are working on a massive infrastructure. The Configuration Management tool like a Puppet was introduced to resolve such issues.

What is Puppet?

Puppet is a system management tool for centralizing and automating the configuration management process. Puppet is also used as a software deployment tool. It is an open-source configuration management software widely used for server configuration, management, deployment, and orchestration of various applications and services across the whole infrastructure of an organization. Puppet is specially designed to manage the configuration of Linux and Windows systems. It is written in Ruby and uses its unique Domain Specific Language (DSL) to describe system configuration.

What are the Puppet versions?

Puppet comes in two versions:

- **Open Source Puppet:** It is a basic version of Puppet configuration management tool, which is also known as Open Source Puppet. It is available directly from Puppet's website and is licensed under the Apache 2.0 system.
- **Puppet Enterprise:** Commercial version that offers features like compliance reporting, orchestration, role-based access control, GUI, API, and command-line tools for effective management of nodes

Implementation:

- Go to EC2
- Go to security groups
- Create a security group

aws Services Search for services, features, blogs, docs, and more [Alt+S] Cloud9 IAM Elastic Beanstalk CodePipeline EC2 Lambda API Gateway N. Virginia mayuri.yerande

EC2 > Security Groups > Create security group

Create security group [Info](#)

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.

Basic details

Security group name [Info](#)
exp12
Name cannot be edited after creation.

Description [Info](#)
hello

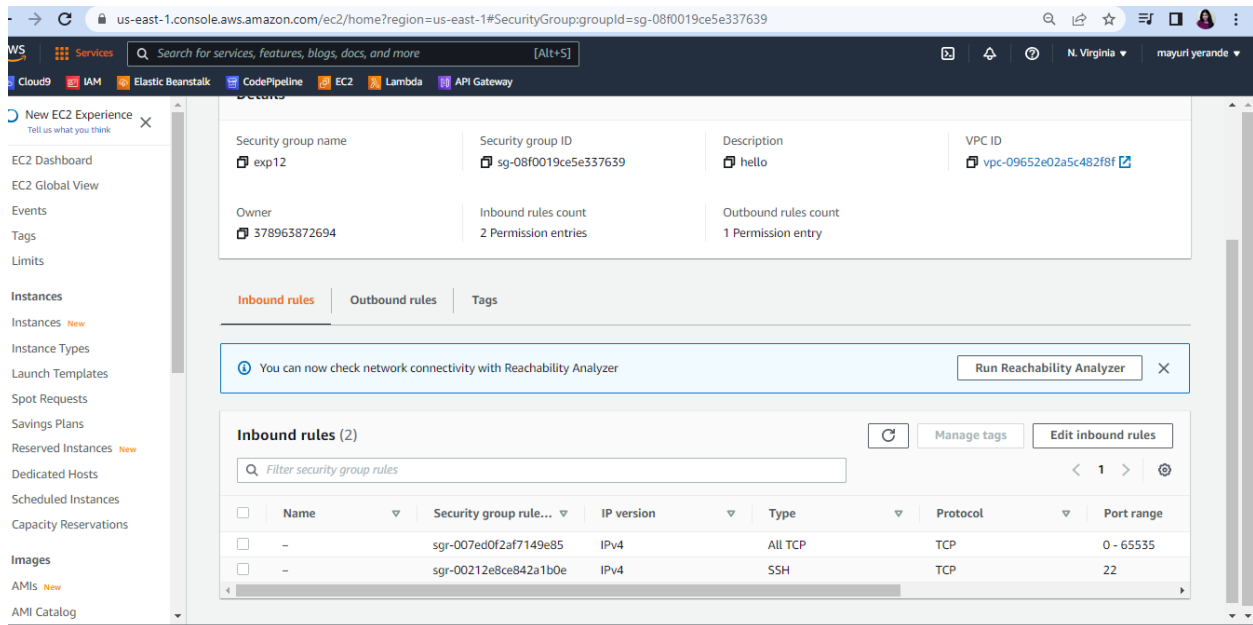
VPC [Info](#)
vpc-09652e02a5c482f8f X

Inbound rules [Info](#)

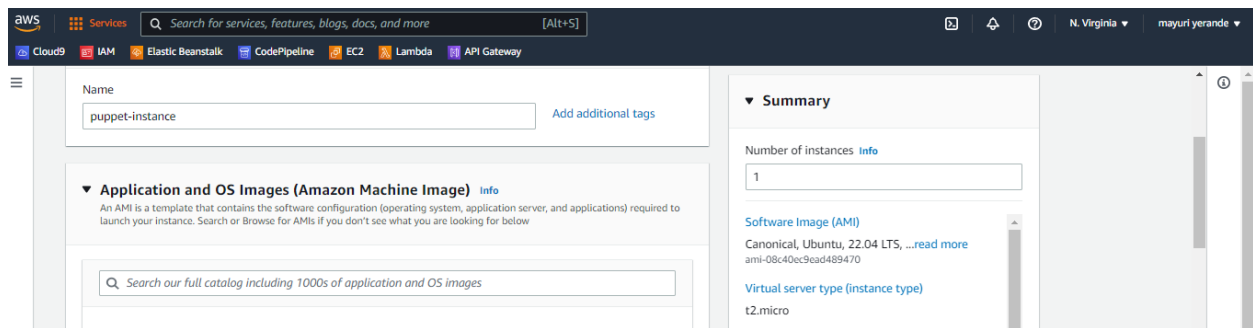
Type Info	Protocol Info	Port range Info	Source Info	Description - optional Info
SSH	TCP	22	Anywh... 0.0.0.0/0 X	 Delete
All TCP	TCP	0 - 65535	Anywh... 0.0.0.0/0 X	 Delete

Add rule

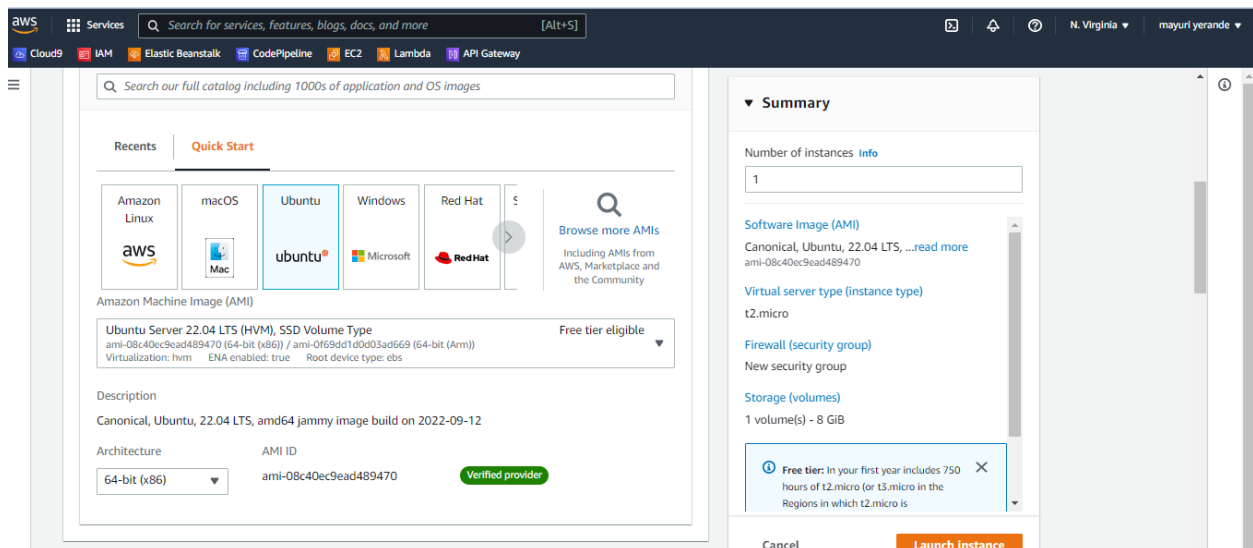
Outbound rules [Info](#)



- Launch an instance



- Choose ubuntu



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Cloud9 IAM Elastic Beanstalk CodePipeline EC2 Lambda API Gateway

▼ Instance type Info

Instance type

t2.micro Free tier eligible Compare instance types

Family: t2 1 vCPU 1 GiB Memory
On-Demand Linux pricing: 0.0116 USD per Hour
On-Demand Windows pricing: 0.0162 USD per Hour

▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

Proceed without a key pair (Not recommended) Default value Create new key pair

▼ Network settings Info Edit

Network Info

▼ Summary

Number of instances Info

1

Software Image (AMI)

Canonical, Ubuntu, 22.04 LTS, ...read more
ami-08c40ec9ead489470

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is)

Cancel Launch instance

- Choose the security group that you created

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Cloud9 IAM Elastic Beanstalk CodePipeline EC2 Lambda API Gateway

vpc-09652e02a5c482f8f

Subnet Info

No preference (Default subnet in any availability zone)

Auto-assign public IP Info

Enable

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group Select existing security group

Common security groups Info

Select security groups

exp12 sg-08f0019ce5e337639 X
VPC: vpc-09652e02a5c482f8f

Security groups that you add or remove here will be added to or removed from all your network interfaces.

▼ Configure storage Info Advanced

1x 8 GiB gp2 Root volume

▼ Summary

Number of instances Info

1

Software Image (AMI)

Canonical, Ubuntu, 22.04 LTS, ...read more
ami-08c40ec9ead489470

Virtual server type (instance type)

t2.micro

Firewall (security group)

exp12

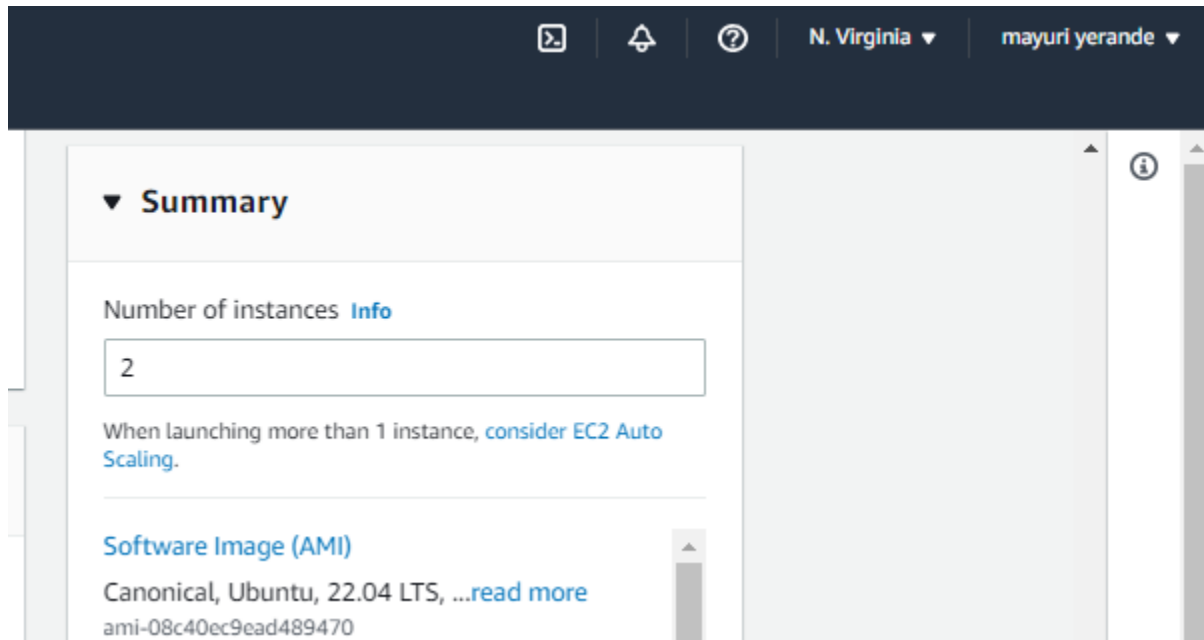
Storage (volumes)

1 volume(s) - 8 GiB

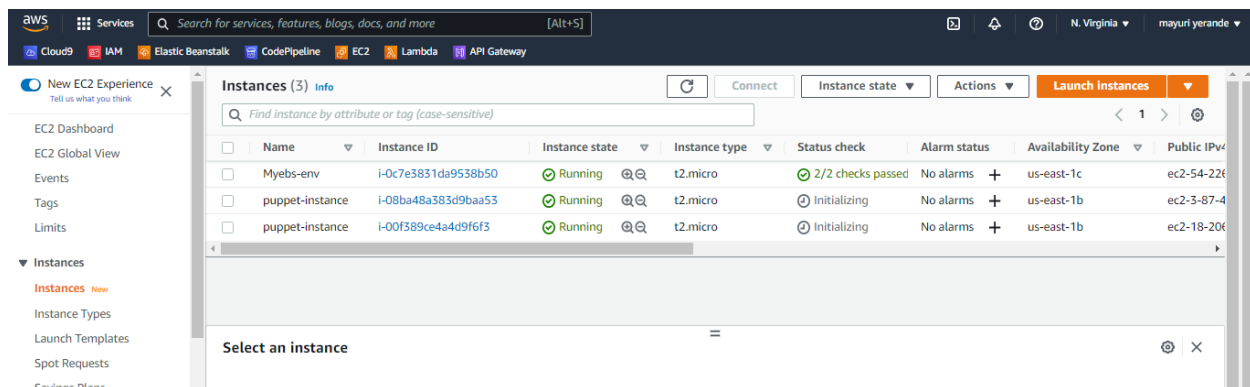
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is)

Cancel Launch instance

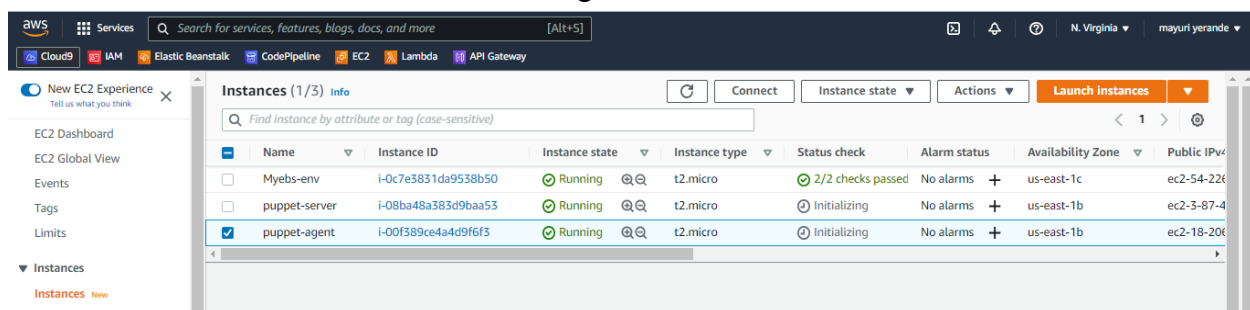
- Enter Number of instances: 2



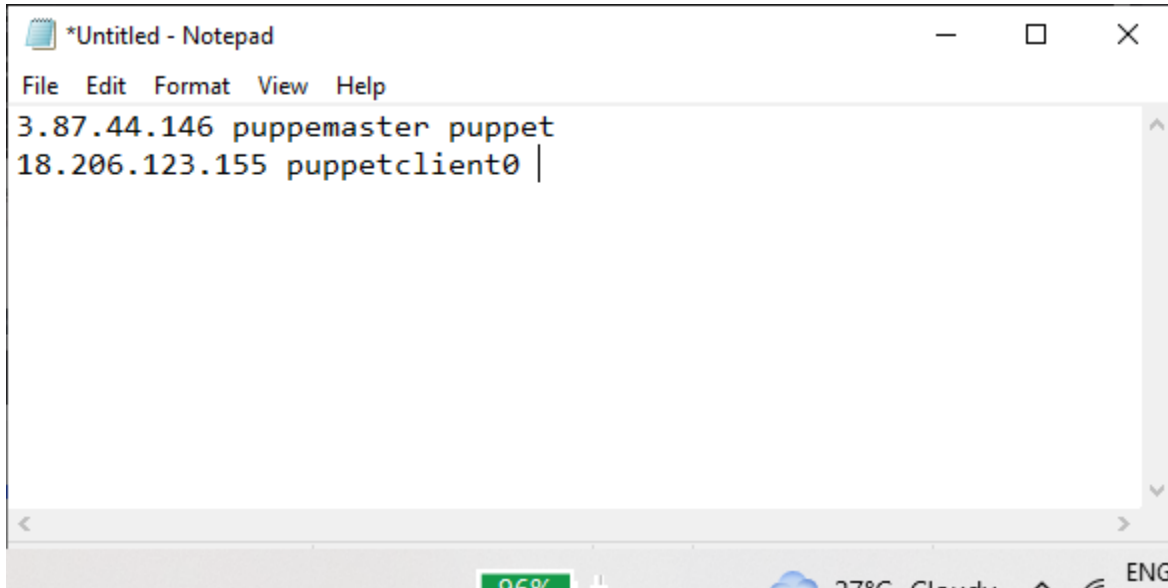
- Click on launch instance
- Your instances are now running



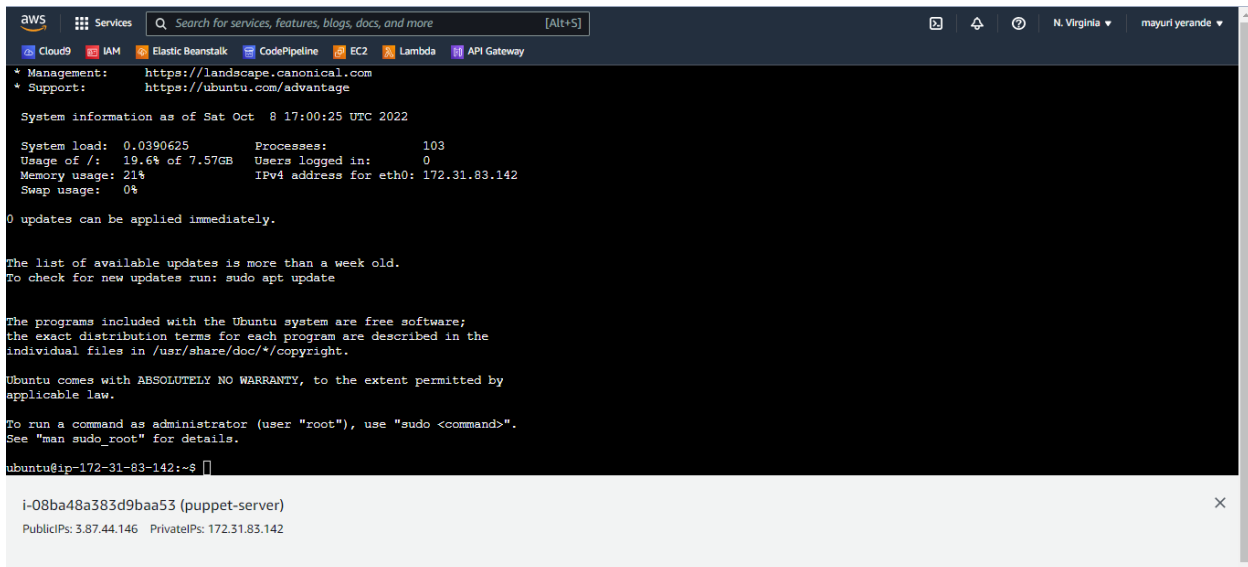
- Rename the server as “server” and “agent”

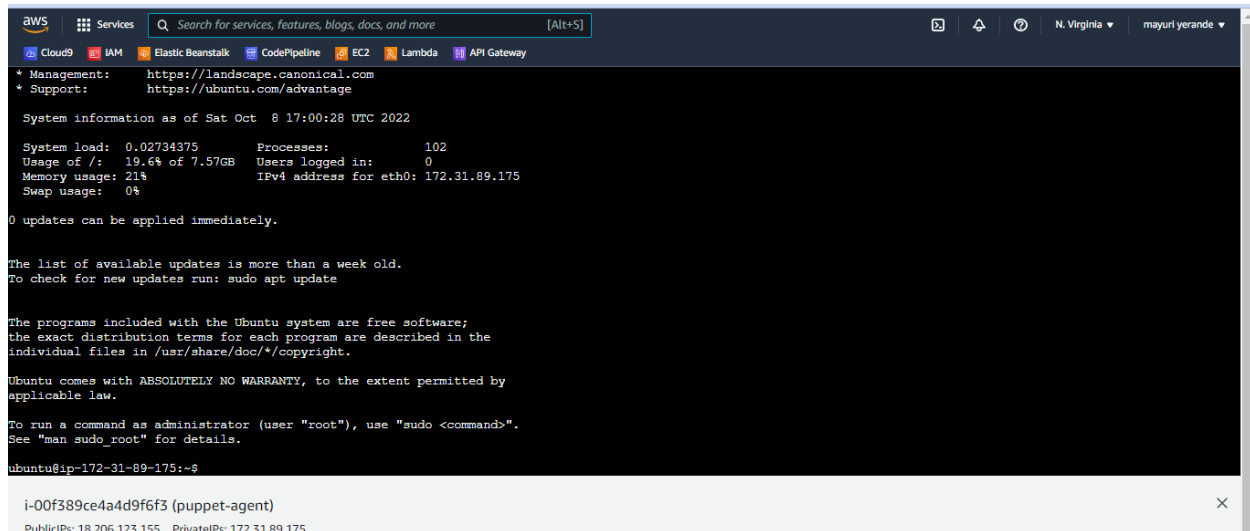


- Copy server and agents Public ipv4 address and keep it stored in a file



- Connect your both instances





```

aws
Services Search for services, features, blogs, docs, and more [Alt+S]
Cloud9 IAM Elastic Beanstalk CodePipeline EC2 Lambda API Gateway
Management: https://landscape.canonical.com
Support: https://ubuntu.com/advantage

System information as of Sat Oct 8 17:00:28 UTC 2022

System load: 0.02734375 Processes: 102
Usage of /: 19.6% of 7.57GB Users logged in: 0
Memory usage: 21% IPv4 address for eth0: 172.31.89.175
Swap usage: 0%

0 updates can be applied immediately.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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-172-31-89-175:~$

i-00f389ce4a4d9f6f3 (puppet-agent)
PublicIPs: 18.206.123.155 PrivateIPs: 172.31.89.175

```

- Run “sudo apt-get update -y” command on both instances.

```

Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [272 B]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [6752 B]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [9240 B]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [352 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Fetched 23.6 MB in 4s (6373 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-83-142:~$

```

i-08ba48a383d9baa53 (puppet-server)
PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

```

Get:35 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [63.8 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [2408 B]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [4192 B]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [900 B]
Get:39 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [228 B]
Fetched 23.6 MB in 4s (6424 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-89-175:~$

```

i-00f389ce4a4d9f6f3 (puppet-agent)
PublicIPs: 18.206.123.155 PrivateIPs: 172.31.89.175

- On server&agent: sudo nano /etc/hosts

The image displays two screenshots of an AWS Management Console terminal window. The terminal is running a nano editor on a Linux instance, editing the `/etc/hosts` file. The content of the file is as follows:

```
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
```

The first screenshot shows the terminal output for the instance `i-08ba48a383d9baa53 (puppet-server)` with PublicIPs: 3.87.44.146 and PrivateIPs: 172.31.83.142. The second screenshot shows the terminal output for the instance `i-00f389ce4a4d9f6f3 (puppet-agent)` with PublicIPs: 18.206.123.155 and PrivateIPs: 172.31.89.175. Both screenshots show the same nano editor interface with the `/etc/hosts` file being edited.

- Copy the lines written in notepad and paste them

```

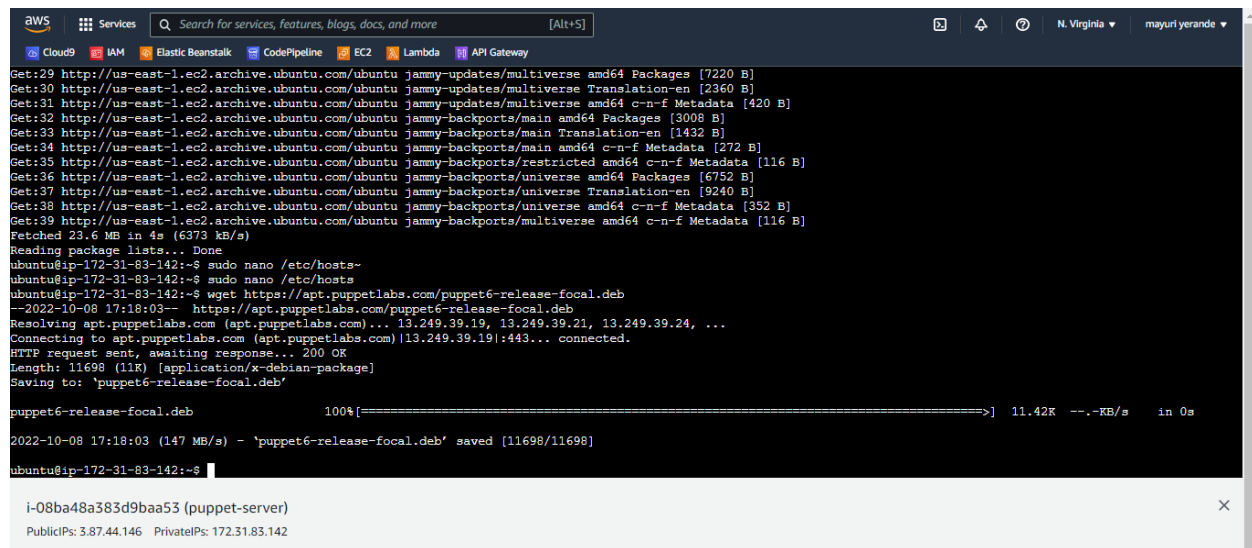
GNU nano 6.2
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts

3.87.44.146 puppetmaster puppet
18.206.123.155 puppetclient0

```

- Then ctrl s to save and ctrl x to quit
- On server: wget <https://apt.puppetlabs.com/puppet6-release-focal.deb>



```

AWS
Services
Q Search for services, features, blogs, docs, and more [Alt+S]
Cloud9 IAM Elastic Beanstalk CodePipeline EC2 Lambda API Gateway
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [7220 B]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [2360 B]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [420 B]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [3008 B]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [1432 B]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [272 B]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [6752 B]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [9240 B]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [352 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Fetched 23.6 MB in 4s (6373 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-83-142:~$ sudo nano /etc/hosts-
ubuntu@ip-172-31-83-142:~$ sudo nano /etc/hosts
ubuntu@ip-172-31-83-142:~$ wget https://apt.puppetlabs.com/puppet6-release-focal.deb
--2022-10-08 17:18:03-- https://apt.puppetlabs.com/puppet6-release-focal.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 13.249.39.19, 13.249.39.21, 13.249.39.24, ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|13.249.39.19|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11698 (11K) [application/x-debian-package]
Saving to: 'puppet6-release-focal.deb'

puppet6-release-focal.deb 100%[=====] 11.42K --.-KB/s in 0s

2022-10-08 17:18:03 (147 MB/s) - 'puppet6-release-focal.deb' saved [11698/11698]

ubuntu@ip-172-31-83-142:~$

```

i-08ba48a383d9baa53 (puppet-server)
PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: sudo dpkg -i puppet6-release-focal.deb

```

ubuntu@ip-172-31-83-142:~$ sudo dpkg -i puppet6-release-focal.deb
Selecting previously unselected package puppet6-release.
(Reading database ... 63663 files and directories currently installed.)
Preparing to unpack puppet6-release-focal.deb ...
Unpacking puppet6-release (6.0.0-22focal) ...
Setting up puppet6-release (6.0.0-22focal) ...
ubuntu@ip-172-31-83-142:~$

```

i-08ba48a383d9baa53 (puppet-server)
PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: `sudo apt-get update -y`

```
ubuntu@ip-172-31-83-142:~$ sudo apt-get update -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:5 http://apt.puppetlabs.com focal InRelease [115 kB]
Get:6 http://apt.puppetlabs.com focal/puppet6 all Packages [10.1 kB]
Get:7 http://apt.puppetlabs.com focal/puppet6 amd64 Packages [30.9 kB]
Fetched 156 kB in 1s (218 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-83-142:~$
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: `sudo apt-get install puppetserver -y`

```
aws Services Search for services, features, blogs, docs, and more [Alt+S]
Cloud9 IAM Elastic Beanstalk CodePipeline EC2 Lambda API Gateway
Adding debian:AC_RA12_FHMT-RCM.pem
Adding debian:certSIGN_ROOT_CA.pem
Adding debian:emSign_ECC_Root_CA_-_C3.pem
done.
Setting up puppetserver (6.20.0-1focal) ...
usermod: no changes
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for ca-certificates (20211016) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
done.
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-83-142:~$
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: `sudo nano /etc/default/puppetserver`

```
GNU nano 6.2 /etc/default/puppetserver
#####
# Init settings for puppetserver
#####

# Location of your Java binary (version 8)
JAVA_BIN="/usr/bin/java"

# Modify this if you'd like to change the memory allocation, enable JMX, etc
JAVA_ARGS="-Xms2g -Xmx2g -Djruby.logger.class=com.puppetlabs.jruby_utils.jruby.Slf4jLogger"

# Modify this as you would JAVA_ARGS but for non-service related subcommands
JAVA_ARGS_CLI="${JAVA_ARGS_CLI:-}"

# Modify this if you'd like TrapperKeeper specific arguments
TK_ARGS=""

# These normally shouldn't need to be edited if using OS packages
USER="puppet"
GROUP="puppet"
INSTALL_DIR="/opt/puppetlabs/server/apps/puppetserver"
CONFIG="/etc/puppetlabs/puppetserver/conf.d"

# Bootstrap path
BOOTSTRAP_CONFIG="/etc/puppetlabs/puppetserver/services.d/,/opt/puppetlabs/server/apps/puppetserver/config/services.d/"

^C Help      ^O Write Out  ^W Where Is  ^T Cut       ^E Execute   ^G Location  ^Z Undo      ^M Set Mark  ^I To Bracket ^J Previous
^X Exit      ^R Read File  ^N Replace   ^P Paste     ^J Justify   ^Y Go To Line ^- Redo      ^C Copy      ^_ Where Was  ^- Next
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- Do the following changes

```
# Modify this if you'd like to change the memory allocation, enable JMX, etc
JAVA_ARGS="-Xms200m -Xmx200m -Djruby.logger.class=com.puppetlabs.jruby_utils.jruby.Slf4jLogger"

# Modify this as you would JAVA_ARGS but for non-service related subcommands
JAVA_ARGS_CLI="${JAVA_ARGS_CLI:-}"
```

- On server: sudo systemctl restart puppetserver

```
ubuntu@ip-172-31-83-142:~$ sudo systemctl restart puppetserver
ubuntu@ip-172-31-83-142:~$
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: sudo systemctl enable puppetserver

```
ubuntu@ip-172-31-83-142:~$ sudo systemctl enable puppetserver
Synchronizing state of puppetserver.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable puppetserver
Created symlink /etc/systemd/system/multi-user.target.wants/puppetserver.service → /lib/systemd/system/puppetserver.service.
ubuntu@ip-172-31-83-142:~$
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: sudo systemctl status puppetserver

```
ubuntu@ip-172-31-83-142:~$ sudo systemctl status puppetserver
● puppetserver.service - puppetserver Service
   Loaded: loaded (/lib/systemd/system/puppetserver.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2022-10-08 17:28:54 UTC; 2min 12s ago
     Main PID: 4379 (java)
        Tasks: 40 (limit: 4915)
       Memory: 473.5M
          CPU: 40.920s
      CGroup: /system.slice/puppetserver.service
              └─4379 /usr/bin/java -Xms200m -Xmx200m -Djruby.logger.class=com.puppetlabs.jruby_utils.jruby.Slf4j

Oct 08 17:28:08 ip-172-31-83-142 systemd[1]: Starting puppetserver Service...
Oct 08 17:28:54 ip-172-31-83-142 systemd[1]: Started puppetserver Service.
Oct 08 17:30:02 ip-172-31-83-142 systemd[1]: /lib/systemd/system/puppetserver.service:45: Standard output type
Oct 08 17:30:03 ip-172-31-83-142 systemd[1]: /lib/systemd/system/puppetserver.service:45: Standard output type
Oct 08 17:30:03 ip-172-31-83-142 systemd[1]: /lib/systemd/system/puppetserver.service:45: Standard output type
lines 1-15/15 (END)
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- Press q to get out of the console
- Now puppet server is running successfully.
- Go to agent(client) server now.
- On client/agent: wget <https://apt.puppetlabs.com/puppet6-release-focal.deb>

```
ubuntu@ip-172-31-89-175:~$ wget https://apt.puppetlabs.com/puppet6-release-focal.deb
--2022-10-08 17:33:34-- https://apt.puppetlabs.com/puppet6-release-focal.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 18.165.83.25, 18.165.83.58, 18.165.83.105, ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|18.165.83.25|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11698 (11K) [application/x-debian-package]
Saving to: 'puppet6-release-focal.deb'

puppet6-release-focal.deb      100%[=====>] 11.42K  --.-KB/s   in 0s

2022-10-08 17:33:34 (302 MB/s) - 'puppet6-release-focal.deb' saved [11698/11698]

ubuntu@ip-172-31-89-175:~$
```

i-00f389ce4a4d9f6f3 (puppet-agent)
PublicIPs: 18.206.123.155 PrivateIPs: 172.31.89.175

- On client/agent: `sudo dpkg -i puppet6-release-focal.deb`
- On client/agent: `sudo apt-get update -y`

```
ubuntu@ip-172-31-89-175:~$ sudo dpkg -i puppet6-release-focal.deb
Selecting previously unselected package puppet6-release.
(Reading database ... 63663 files and directories currently installed.)
Preparing to unpack puppet6-release-focal.deb ...
Unpacking puppet6-release (6.0.0-22focal) ...
Setting up puppet6-release (6.0.0-22focal) ...
ubuntu@ip-172-31-89-175:~$ sudo apt-get update -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 http://apt.puppetlabs.com focal InRelease [115 kB]
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:6 http://apt.puppetlabs.com focal/puppet6 all Packages [10.1 kB]
Get:7 http://apt.puppetlabs.com focal/puppet6 amd64 Packages [30.9 kB]
Fetched 156 kB in 1s (309 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-89-175:~$
```

i-00f389ce4a4d9f6f3 (puppet-agent)
PublicIPs: 18.206.123.155 PrivateIPs: 172.31.89.175

- On client/agent: `sudo apt-get install puppet-agent -y`

```

Fetched 38.0 MB in 1s (63.7 MB/s)
Selecting previously unselected package puppet-agent.
(Reading database ... 63668 files and directories currently installed.)
Preparing to unpack .../puppet-agent_6.28.0-1focal_amd64.deb ...
Unpacking puppet-agent (6.28.0-1focal) ...
Setting up puppet-agent (6.28.0-1focal) ...
Created symlink /etc/systemd/system/multi-user.target.wants/puppet.service → /lib/systemd/system/puppet.service.
Created symlink /etc/systemd/system/multi-user.target.wants/pxp-agent.service → /lib/systemd/system/pxp-agent.service.
Removed /etc/systemd/system/multi-user.target.wants/pxp-agent.service.
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-89-175:~$

```

i-00f389ce4a4d9f6f3 (puppet-agent)
PublicIPs: 18.206.123.155 PrivateIPs: 172.31.89.175

- On client/agent: `sudo systemctl start puppet`
- On client/agent: `sudo systemctl enable puppet`
- On client/agent: `sudo systemctl status puppet`

```

ubuntu@ip-172-31-89-175:~$ sudo systemctl start puppet
ubuntu@ip-172-31-89-175:~$ sudo systemctl enable puppet
ubuntu@ip-172-31-89-175:~$ sudo systemctl status puppet
● puppet.service - Puppet agent
   Loaded: loaded (/lib/systemd/system/puppet.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2022-10-08 17:39:34 UTC; 28s ago
     Main PID: 2692 (puppet)
        Tasks: 2 (limit: 1143)
       Memory: 54.3M
          CPU: 2.393s
      CGroup: /system.slice/puppet.service
              └─2692 /opt/puppetlabs/puppet/bin/ruby /opt/puppetlabs/puppet/bin/puppet agent --no-daemonize

Oct 08 17:39:34 ip-172-31-89-175 systemd[1]: Started Puppet agent.
Oct 08 17:39:35 ip-172-31-89-175 puppet-agent[2692]: Starting Puppet client version 6.28.0
ubuntu@ip-172-31-89-175:~$

```

i-00f389ce4a4d9f6f3 (puppet-agent)
PublicIPs: 18.206.123.155 PrivateIPs: 172.31.89.175

- Thus both server and client are actively running.
- On server: `sudo /opt/puppetlabs/bin/puppetserver ca list`

```

ubuntu@ip-172-31-83-142:~$ sudo /opt/puppetlabs/bin/puppetserver ca list
Requested Certificates:
  ip-172-31-89-175.ec2.internal (SHA256) 79:79:23:00:4F:86:68:0F:1B:8D:CB:24:DA:16:59:C6:E2:B9:46:84:5C:A8:EA:72:F4:40:73:91:10:81:E4:63
ubuntu@ip-172-31-83-142:~$

```

i-08ba48a383d9baa53 (puppet-server)
PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: `sudo /opt/puppetlabs/bin/puppetserver ca sign --all`

```
ubuntu@ip-172-31-83-142:~$ sudo /opt/puppetlabs/bin/puppetserver ca sign --all
Successfully signed certificate request for ip-172-31-89-175.ec2.internal
ubuntu@ip-172-31-83-142:~$
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- On server: `sudo /opt/puppetlabs/bin/puppet agent --test`

```
ubuntu@ip-172-31-83-142:~$ sudo /opt/puppetlabs/bin/puppet agent --test
Info: Using environment 'production'
Info: Retrieving pluginfacts
Info: Retrieving plugin
Info: Retrieving locales
Info: Caching catalog for ip-172-31-83-142.ec2.internal
Info: Applying configuration version '1665251309'
Info: Creating state file /opt/puppetlabs/puppet/cache/state/state.yaml
Notice: Applied catalog in 0.01 seconds
ubuntu@ip-172-31-83-142:~$
```

i-08ba48a383d9baa53 (puppet-server)

PublicIPs: 3.87.44.146 PrivateIPs: 172.31.83.142

- Thus our server and client are connected

Conclusion: We have installed and Configured Pull based Software Configuration Management and provisioning tools using Puppet.