Puppet Master and Puppet Agent Installation and Configuration Guide

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Introduction

- Puppet is a configuration management tool that allows system administrators to automate the provisioning, configuration, and management of infrastructure. Puppet uses a client-server model where the Puppet Master server controls the configuration of Puppet Agent nodes.
- This guide provides a detailed step-by-step approach to installing and configuring Puppet Master and Puppet Agent in a lab environment. It assumes no prior knowledge of Puppet or infrastructure automation.

Problem Statement

Puppet simplifies system management by enabling centralized configuration control across multiple systems. The objective is to set up a Puppet Master to manage configurations and a Puppet Agent to receive and apply those configurations.

Prerequisites

Software Requirements

- **Operating System:** Ubuntu Trusty Tahr 14.04 (ISO: Download Here)
- **Virtual Machine Manager:** Oracle VirtualBox

Hardware Requirements

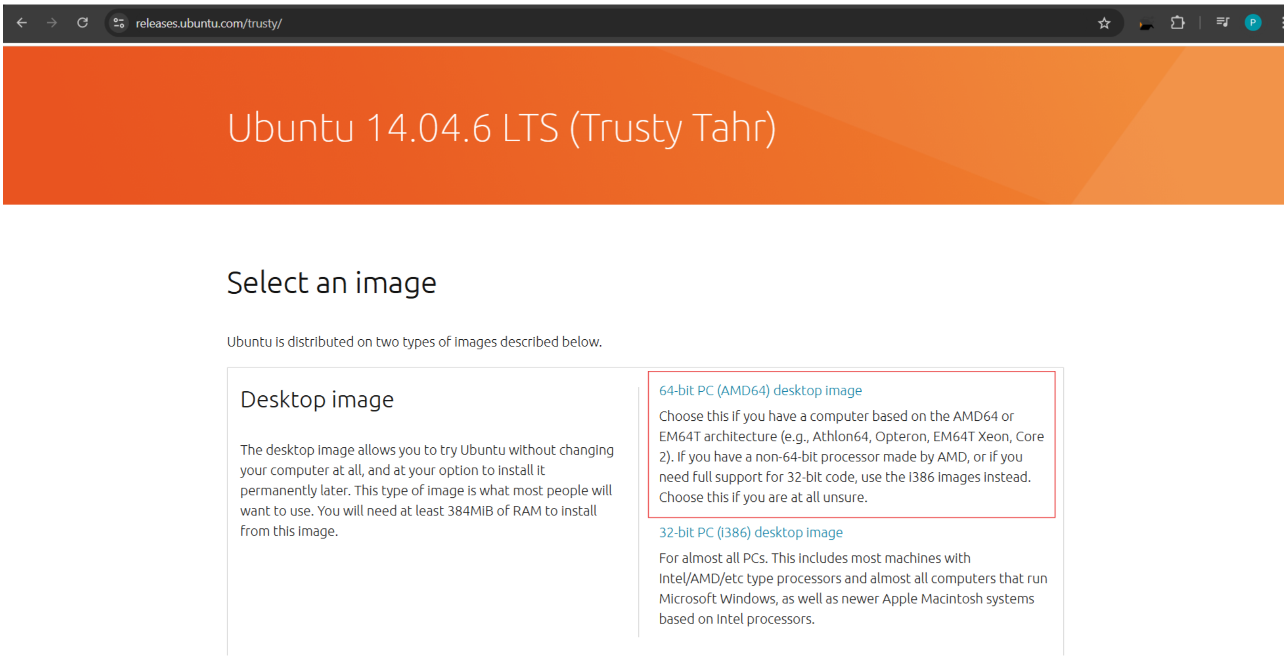
- **Processor:** 64-bit architecture.
- **RAM:** Minimum 4 GB.
- **Disk Space:** Minimum 50 GB.
- **Internet Connection:** Required for package installation and updates.

Implementation Steps

Step 1: Download and Install Required Tools

1. **Download Ubuntu ISO**:

   - URL: Ubuntu 14.04 ISO download the desktop version.



releases.ubuntu.com/trusty/

Ubuntu 14.04.6 LTS (Trusty Tahr)

Select an image

Ubuntu is distributed on two types of images described below.

Desktop image

The desktop image allows you to try Ubuntu without changing your computer at all, and at your option to install it permanently later. This type of image is what most people will want to use. You will need at least 384MiB of RAM to install from this image.

64-bit PC (AMD64) desktop image

Choose this if you have a computer based on the AMD64 or EM64T architecture (e.g., Athlon64, Opteron, EM64T Xeon, Core 2). If you have a non-64-bit processor made by AMD, or if you need full support for 32-bit code, use the i386 images instead. Choose this if you are at all unsure.

32-bit PC (i386) desktop image

For almost all PCs. This includes most machines with Intel/AMD/etc type processors and almost all computers that run Microsoft Windows, as well as newer Apple Macintosh systems based on Intel processors.

> *Purpose:* The ISO is used to install the operating system for both the Puppet Master and Puppet Agent.

2. **Install VirtualBox**:

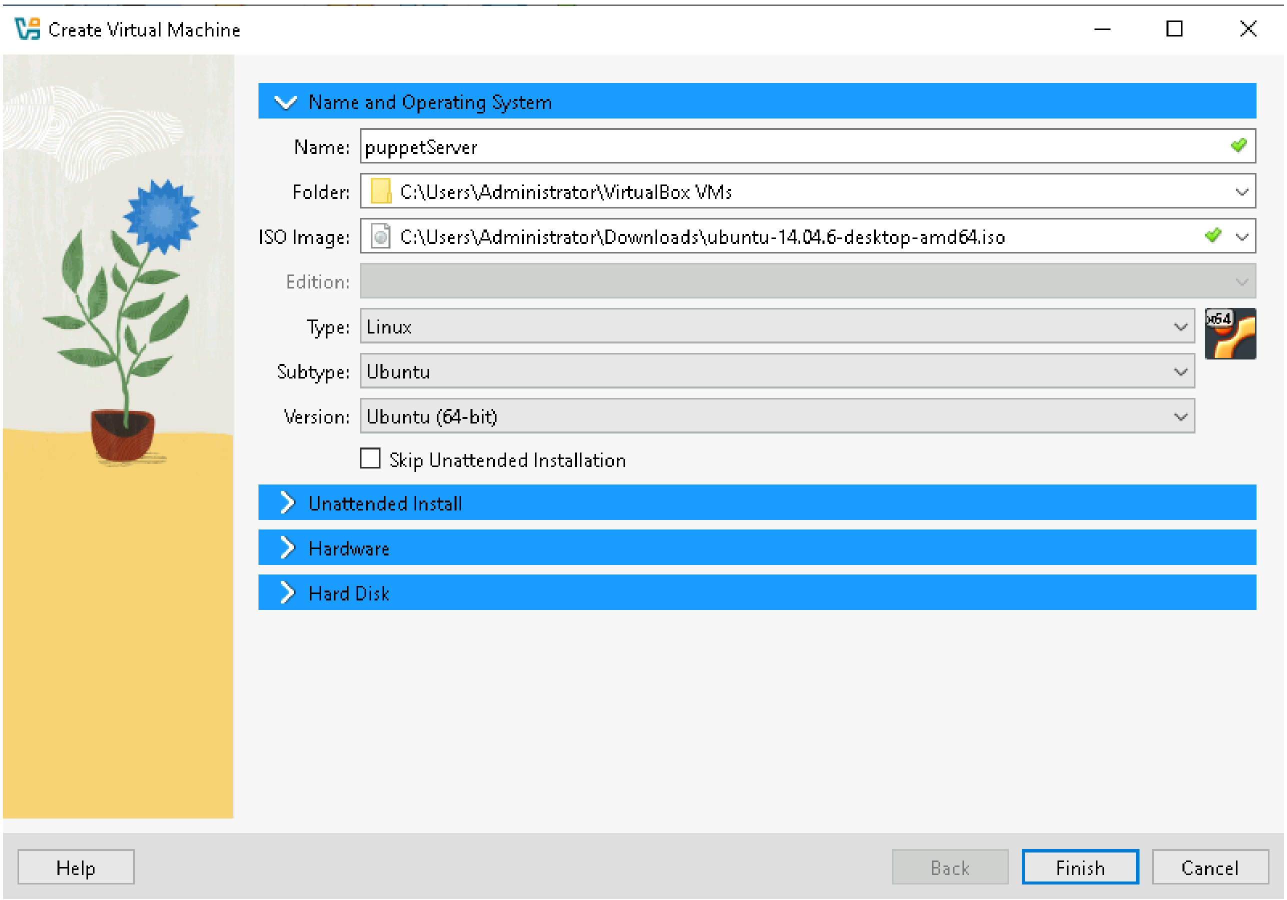
   - Download from VirtualBox Official Site.
   - Follow the installation instructions for your host operating system.

> *Purpose:* VirtualBox provides an isolated environment to create virtual machines.

Step 2: Set Up Virtual Machines

1. **Create Virtual Machines in VirtualBox**:

   - Open VirtualBox and click **New** to create two VMs:
     - **VM1:** Name it `puppetServer` (Master).
     - **VM2:** Name it `puppetClient` (Agent).



Name: puppetServer

Folder: C:\Users\Administrator\VirtualBox VMs

ISO Image: C:\Users\Administrator\Downloads\ubuntu-14.04.6-desktop-amd64.iso

Edition:

Type: Linux

Subtype: Ubuntu

Version: Ubuntu (64-bit)

☐ Skip Unattended Installation

- Assign 2 GB RAM, 20 GB disk space, and attach the Ubuntu ISO file for installation.

> *Purpose:* One VM will serve as the Puppet Master and the other as the Puppet Agent.

2. **Install Ubuntu on Each VM**:

    2. **Install Ubuntu on Each VM**:

        - Boot the VM with the ISO and follow the guided Ubuntu installation.

        - For detailed installation instructions, refer to the Ubuntu Installation Guide.

        - Set hostnames during setup:

            - VM1: `puppetServer`
            - VM2: `puppetClient`

Step 3: Configure Networking

1. **Set Network Mode to Bridged Adapter**:

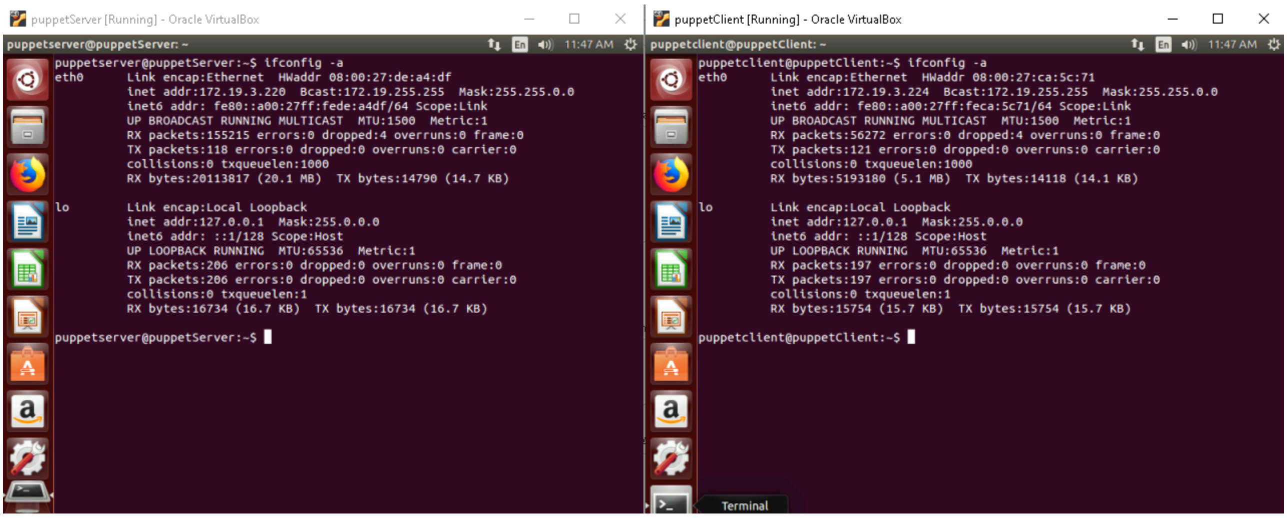
    - In VirtualBox, go to **Settings > Network** for both VMs.
    - Change the adapter type to **Bridged Adapter**.
    - Start both VMs.

> *Purpose:* Ensures both VMs are on the same network and can communicate with each other.

2. **Verify Network Configuration**:

- Open a terminal in each VM and run:

  ```
  ifconfig -a
  ```


puppetServer [Running] - Oracle VirtualBox
puppetserver@puppetServer: ~
11:47 AM
puppetClient [Running] - Oracle VirtualBox
puppetclient@puppetClient: ~
11:47 AM
Terminal

```
puppetserver@puppetServer:~$ ifconfig -a
eth0      Link encap:Ethernet  HWaddr 08:00:27:de:a4:df
          inet addr:172.19.3.220  Bcast:172.19.255.255  Mask:255.255.0.0
          inet6 addr: fe80::a00:27ff:fede:a4df/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:155215 errors:0 dropped:4 overruns:0 frame:0
          TX packets:118 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:20113817 (20.1 MB)  TX bytes:14790 (14.7 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:206 errors:0 dropped:0 overruns:0 frame:0
          TX packets:206 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:16734 (16.7 KB)  TX bytes:16734 (16.7 KB)

puppetserver@puppetServer:~$
```

```
puppetclient@puppetClient:~$ ifconfig -a
eth0      Link encap:Ethernet  HWaddr 08:00:27:ca:5c:71
          inet addr:172.19.3.224  Bcast:172.19.255.255  Mask:255.255.0.0
          inet6 addr: fe80::a00:27ff:feca:5c71/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:56272 errors:0 dropped:4 overruns:0 frame:0
          TX packets:121 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5193180 (5.1 MB)  TX bytes:14118 (14.1 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:197 errors:0 dropped:0 overruns:0 frame:0
          TX packets:197 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:15754 (15.7 KB)  TX bytes:15754 (15.7 KB)

puppetclient@puppetClient:~$
```

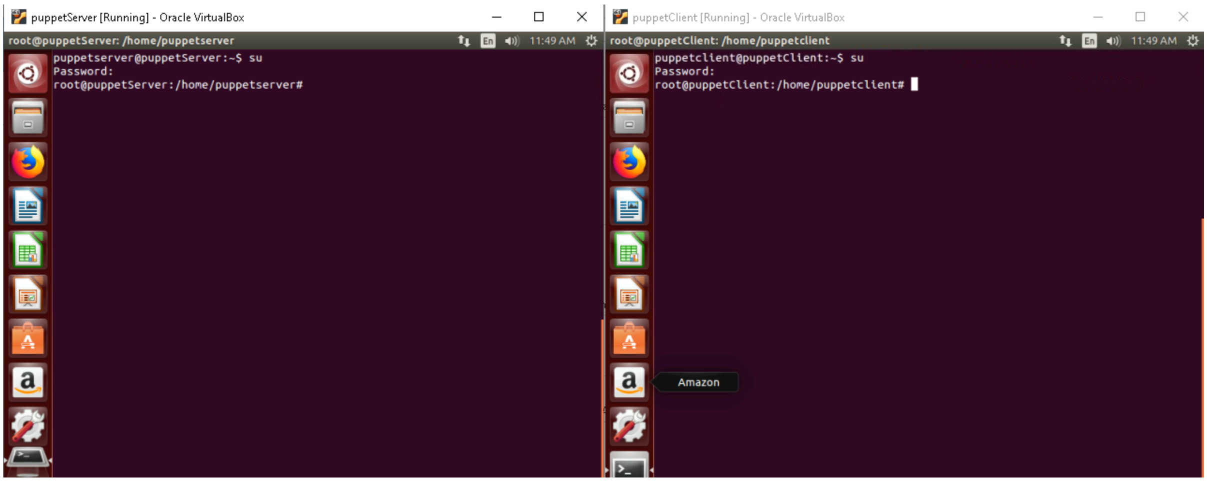
> Note down the IP addresses of both machines.

Step 4: Prepare the Machines

1. **Switch to Root User**:

   - Gain superuser access by running the following command on both VMs:

     ```
     su
     ```


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
11:49 AM
puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
11:49 AM
Amazon

```
puppetserver@puppetServer:~$ su
Password:
root@puppetServer:/home/puppetserver#
```

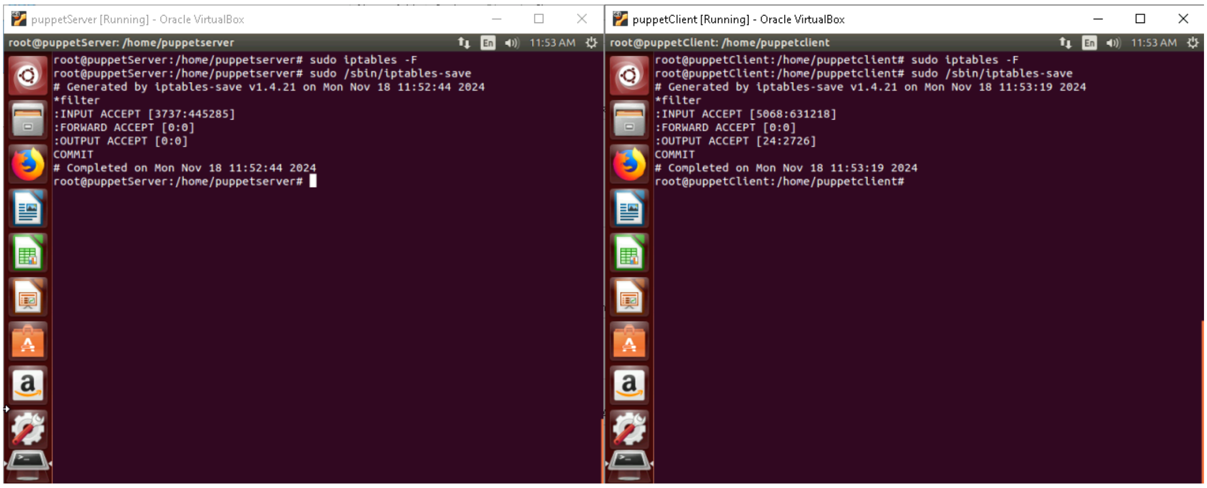
```
puppetclient@puppetClient:~$ su
Password:
root@puppetClient:/home/puppetclient#
```

> *Purpose:* Most of the configuration commands require root privileges.

2. **Disable Firewalls**:

   - Run the following commands on both VMs:

```
sudo iptables -F
sudo /sbin/iptables-save
```


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
11:53 AM
puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
11:53 AM

```
root@puppetServer:/home/puppetserver# sudo iptables -F
root@puppetServer:/home/puppetserver# sudo /sbin/iptables-save
# Generated by iptables-save v1.4.21 on Mon Nov 18 11:52:44 2024
*filter
:INPUT ACCEPT [3737:445285]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
COMMIT
# Completed on Mon Nov 18 11:52:44 2024
root@puppetServer:/home/puppetserver#
```

```
root@puppetClient:/home/puppetclient# sudo iptables -F
root@puppetClient:/home/puppetclient# sudo /sbin/iptables-save
# Generated by iptables-save v1.4.21 on Mon Nov 18 11:53:19 2024
*filter
:INPUT ACCEPT [5068:631218]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [24:2726]
COMMIT
# Completed on Mon Nov 18 11:53:19 2024
root@puppetClient:/home/puppetclient#
```

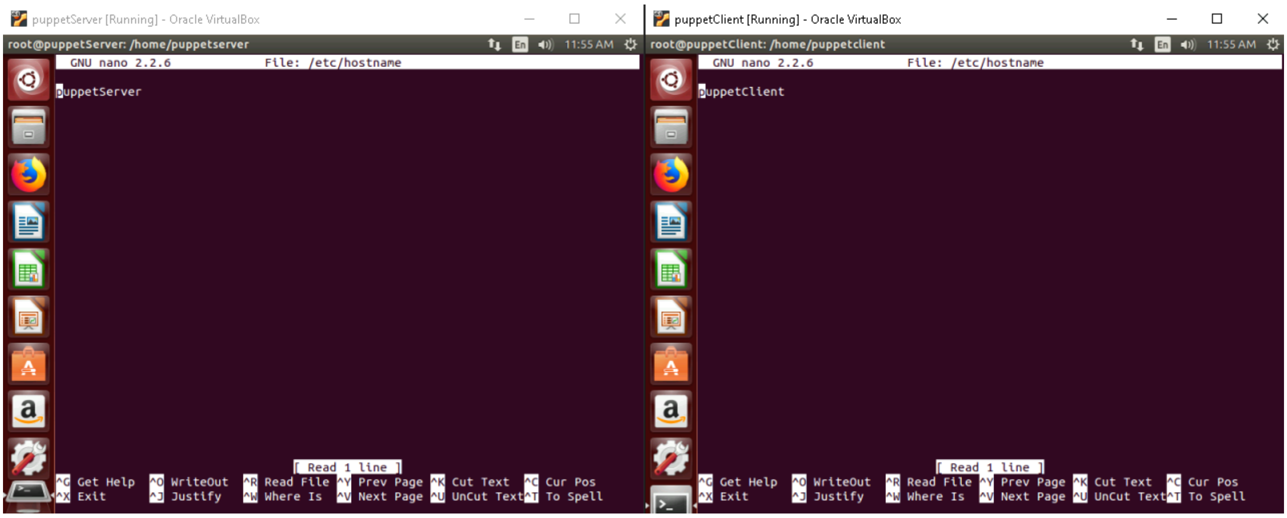
> *Explanation:* Firewalls might block communication between the Puppet Master and Agent, so we disable them temporarily.

3. **Update Hostnames and Hosts File**:

   - Edit the `/etc/hostname` file on each VM to set the hostname using editor of choice (e.g., `nano`):

     ```
     sudo nano /etc/hostname
     ```

   - Set the hostname to `puppetServer` for the Master and `puppetClient` for the Agent.


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
11:55 AM
^G Get Help
^O WriteOut
^R Read File
^Y Prev Page
^K Cut Text
^C Cur Pos
^X Exit
^J Justify
^W Where Is
^V Next Page
^U UnCut Text
^T To Spell
puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
11:55 AM

```
  GNU nano 2.2.6              File: /etc/hostname

puppetServer

                                [ Read 1 line ]
```

```
  GNU nano 2.2.6              File: /etc/hostname

puppetClient

                                [ Read 1 line ]
```

   - Edit the `/etc/hosts` file to add IP mappings for the hostnames on both VMs using editor of choice (e.g., `nano`):

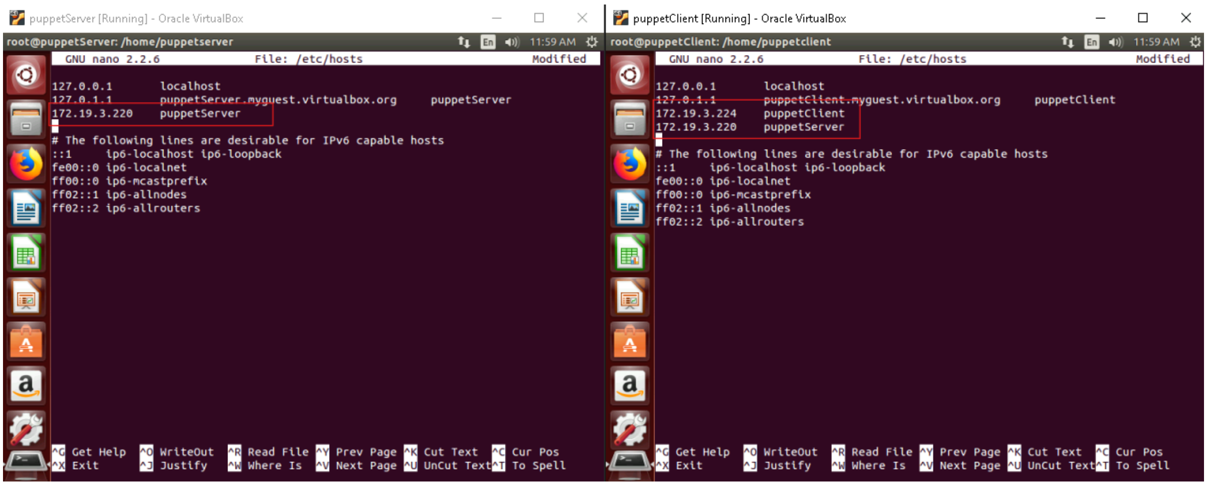
     ```
     sudo nano /etc/hosts
     ```

Add the following lines (replace `<IP-ADDRESS>` with the actual IPs) on puppetClient:

```
<IP-ADDRESS>  puppetServer
<IP-ADDRESS>  puppetClient
```

Add the following lines (replace `<IP-ADDRESS>` with the actual IPs) on puppetServer:

```
<IP-ADDRESS>  puppetServer
```


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
11:59 AM
puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
11:59 AM

```
  GNU nano 2.2.6              File: /etc/hosts                       Modified

127.0.0.1       localhost
127.0.1.1       puppetServer.myguest.virtualbox.org     puppetServer
172.19.3.220    puppetServer

# 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

^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

```
  GNU nano 2.2.6              File: /etc/hosts                       Modified

127.0.0.1       localhost
127.0.1.1       puppetClient.myguest.virtualbox.org     puppetClient
172.19.3.224    puppetClient
172.19.3.220    puppetServer

# 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

^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

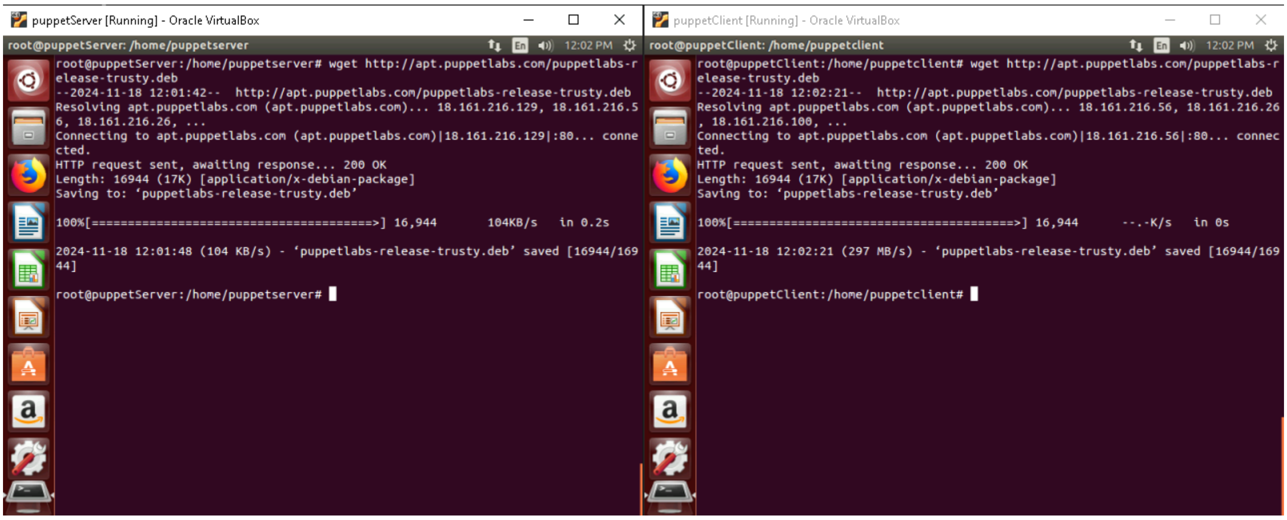
> *Purpose:* The hosts file ensures that both machines can resolve each other's hostnames to IP addresses.

Step 5: Install and Configure Puppet Packages

1. **Add Puppet Repository**:

   Add the Puppet package repository for Ubuntu by running the following commands on both VMs:

   ```
   wget http://apt.puppetlabs.com/puppetlabs-release-trusty.deb
   ```



puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
12:02 PM

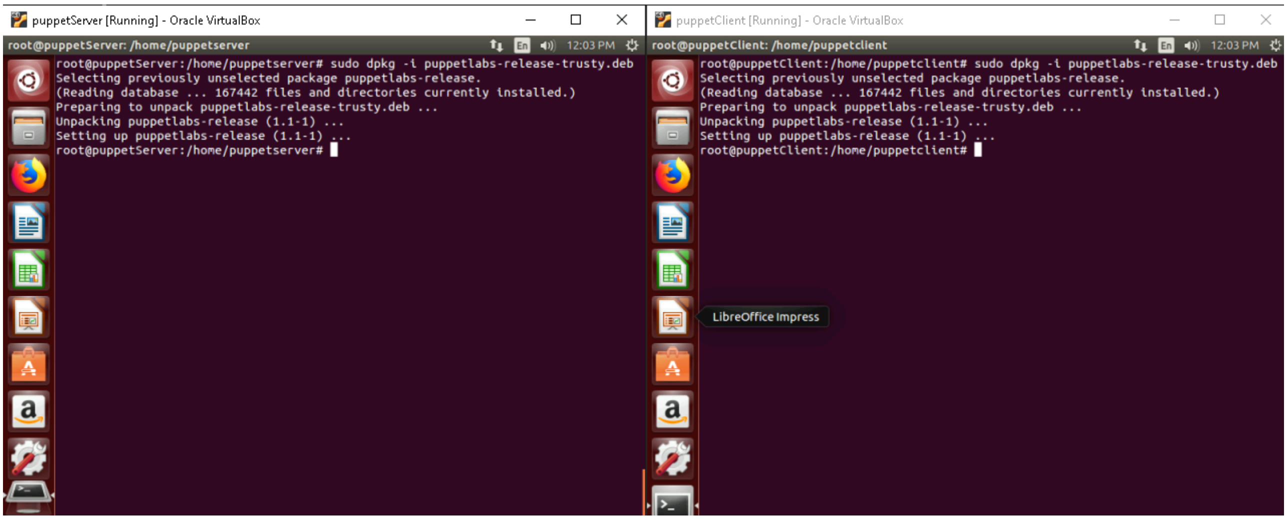
```
root@puppetServer:/home/puppetserver# wget http://apt.puppetlabs.com/puppetlabs-r
elease-trusty.deb
--2024-11-18 12:01:42--  http://apt.puppetlabs.com/puppetlabs-release-trusty.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 18.161.216.129, 18.161.216.5
6, 18.161.216.26, ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|18.161.216.129|:80... conne
cted.
HTTP request sent, awaiting response... 200 OK
Length: 16944 (17K) [application/x-debian-package]
Saving to: ‘puppetlabs-release-trusty.deb’

100%[======================================>] 16,944      104KB/s   in 0.2s

2024-11-18 12:01:48 (104 KB/s) - ‘puppetlabs-release-trusty.deb’ saved [16944/169
44]

root@puppetServer:/home/puppetserver#
```

puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:02 PM

```
root@puppetClient:/home/puppetclient# wget http://apt.puppetlabs.com/puppetlabs-r
elease-trusty.deb
--2024-11-18 12:02:21--  http://apt.puppetlabs.com/puppetlabs-release-trusty.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 18.161.216.56, 18.161.216.26
, 18.161.216.100, ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|18.161.216.56|:80... connec
ted.
HTTP request sent, awaiting response... 200 OK
Length: 16944 (17K) [application/x-debian-package]
Saving to: ‘puppetlabs-release-trusty.deb’

100%[======================================>] 16,944      --.-K/s   in 0s

2024-11-18 12:02:21 (297 MB/s) - ‘puppetlabs-release-trusty.deb’ saved [16944/169
44]

root@puppetClient:/home/puppetclient#
```

Install the repository package using dpkg:

```
sudo dpkg -i puppetlabs-release-trusty.deb
```



puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
12:03 PM

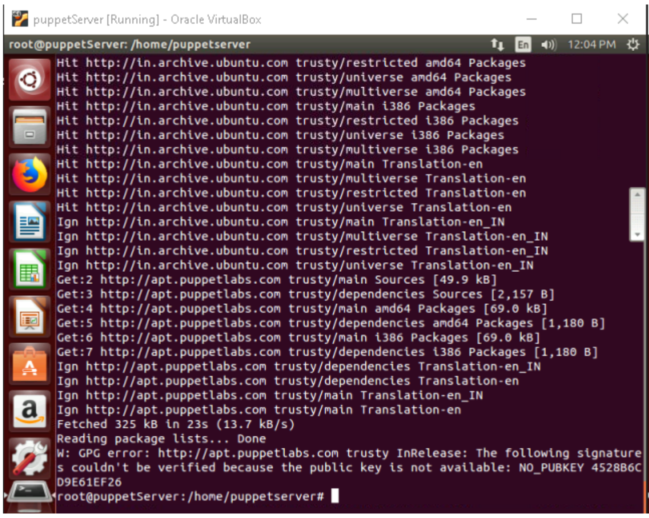
```
root@puppetServer:/home/puppetserver# sudo dpkg -i puppetlabs-release-trusty.deb
Selecting previously unselected package puppetlabs-release.
(Reading database ... 167442 files and directories currently installed.)
Preparing to unpack puppetlabs-release-trusty.deb ...
Unpacking puppetlabs-release (1.1-1) ...
Setting up puppetlabs-release (1.1-1) ...
root@puppetServer:/home/puppetserver#
```

puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:03 PM
LibreOffice Impress

```
root@puppetClient:/home/puppetclient# sudo dpkg -i puppetlabs-release-trusty.deb
Selecting previously unselected package puppetlabs-release.
(Reading database ... 167442 files and directories currently installed.)
Preparing to unpack puppetlabs-release-trusty.deb ...
Unpacking puppetlabs-release (1.1-1) ...
Setting up puppetlabs-release (1.1-1) ...
root@puppetClient:/home/puppetclient#
```

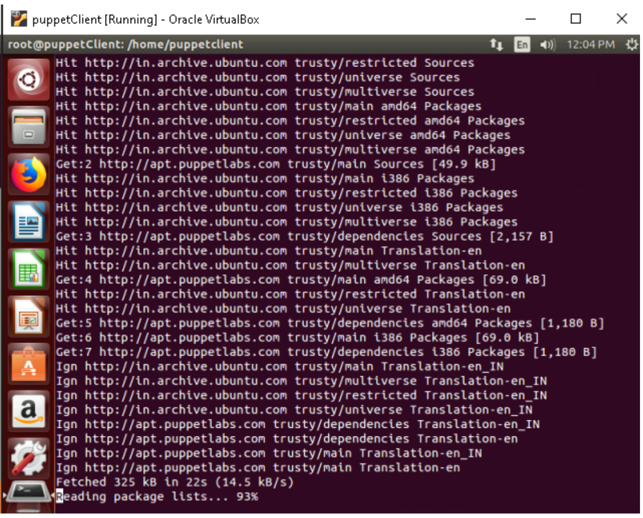
Update the package list:

```
sudo apt-get update
```



puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
12:04 PM

```
Hit http://in.archive.ubuntu.com trusty/restricted amd64 Packages
Hit http://in.archive.ubuntu.com trusty/universe amd64 Packages
Hit http://in.archive.ubuntu.com trusty/multiverse amd64 Packages
Hit http://in.archive.ubuntu.com trusty/main i386 Packages
Hit http://in.archive.ubuntu.com trusty/restricted i386 Packages
Hit http://in.archive.ubuntu.com trusty/universe i386 Packages
Hit http://in.archive.ubuntu.com trusty/multiverse i386 Packages
Hit http://in.archive.ubuntu.com trusty/main Translation-en
Hit http://in.archive.ubuntu.com trusty/multiverse Translation-en
Hit http://in.archive.ubuntu.com trusty/restricted Translation-en
Hit http://in.archive.ubuntu.com trusty/universe Translation-en
Ign http://in.archive.ubuntu.com trusty/main Translation-en_IN
Ign http://in.archive.ubuntu.com trusty/multiverse Translation-en_IN
Ign http://in.archive.ubuntu.com trusty/restricted Translation-en_IN
Ign http://in.archive.ubuntu.com trusty/universe Translation-en_IN
Get:2 http://apt.puppetlabs.com trusty/main Sources [49.9 kB]
Get:3 http://apt.puppetlabs.com trusty/dependencies Sources [2,157 B]
Get:4 http://apt.puppetlabs.com trusty/main amd64 Packages [69.0 kB]
Get:5 http://apt.puppetlabs.com trusty/dependencies amd64 Packages [1,180 B]
Get:6 http://apt.puppetlabs.com trusty/main i386 Packages [69.0 kB]
Get:7 http://apt.puppetlabs.com trusty/dependencies i386 Packages [1,180 B]
Ign http://apt.puppetlabs.com trusty/dependencies Translation-en_IN
Ign http://apt.puppetlabs.com trusty/dependencies Translation-en
Ign http://apt.puppetlabs.com trusty/main Translation-en_IN
Ign http://apt.puppetlabs.com trusty/main Translation-en
Fetched 325 kB in 23s (13.7 kB/s)
Reading package lists... Done
W: GPG error: http://apt.puppetlabs.com trusty InRelease: The following signature
s couldn't be verified because the public key is not available: NO_PUBKEY 4528B6C
D9E61EF26
root@puppetServer:/home/puppetserver#
```



puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:04 PM

```
Hit http://in.archive.ubuntu.com trusty/restricted Sources
Hit http://in.archive.ubuntu.com trusty/universe Sources
Hit http://in.archive.ubuntu.com trusty/multiverse Sources
Hit http://in.archive.ubuntu.com trusty/main amd64 Packages
Hit http://in.archive.ubuntu.com trusty/restricted amd64 Packages
Hit http://in.archive.ubuntu.com trusty/universe amd64 Packages
Hit http://in.archive.ubuntu.com trusty/multiverse amd64 Packages
Get:2 http://apt.puppetlabs.com trusty/main Sources [49.9 kB]
Hit http://in.archive.ubuntu.com trusty/main i386 Packages
Hit http://in.archive.ubuntu.com trusty/restricted i386 Packages
Hit http://in.archive.ubuntu.com trusty/universe i386 Packages
Hit http://in.archive.ubuntu.com trusty/multiverse i386 Packages
Get:3 http://apt.puppetlabs.com trusty/dependencies Sources [2,157 B]
Hit http://in.archive.ubuntu.com trusty/main Translation-en
Hit http://in.archive.ubuntu.com trusty/multiverse Translation-en
Get:4 http://apt.puppetlabs.com trusty/main amd64 Packages [69.0 kB]
Hit http://in.archive.ubuntu.com trusty/restricted Translation-en
Hit http://in.archive.ubuntu.com trusty/universe Translation-en
Get:5 http://apt.puppetlabs.com trusty/dependencies amd64 Packages [1,180 B]
Get:6 http://apt.puppetlabs.com trusty/main i386 Packages [69.0 kB]
Get:7 http://apt.puppetlabs.com trusty/dependencies i386 Packages [1,180 B]
Ign http://in.archive.ubuntu.com trusty/main Translation-en_IN
Ign http://in.archive.ubuntu.com trusty/multiverse Translation-en_IN
Ign http://in.archive.ubuntu.com trusty/restricted Translation-en_IN
Ign http://in.archive.ubuntu.com trusty/universe Translation-en_IN
Ign http://apt.puppetlabs.com trusty/dependencies Translation-en_IN
Ign http://apt.puppetlabs.com trusty/dependencies Translation-en
Ign http://apt.puppetlabs.com trusty/main Translation-en_IN
Ign http://apt.puppetlabs.com trusty/main Translation-en
Fetched 325 kB in 22s (14.5 kB/s)
Reading package lists... 93%
```

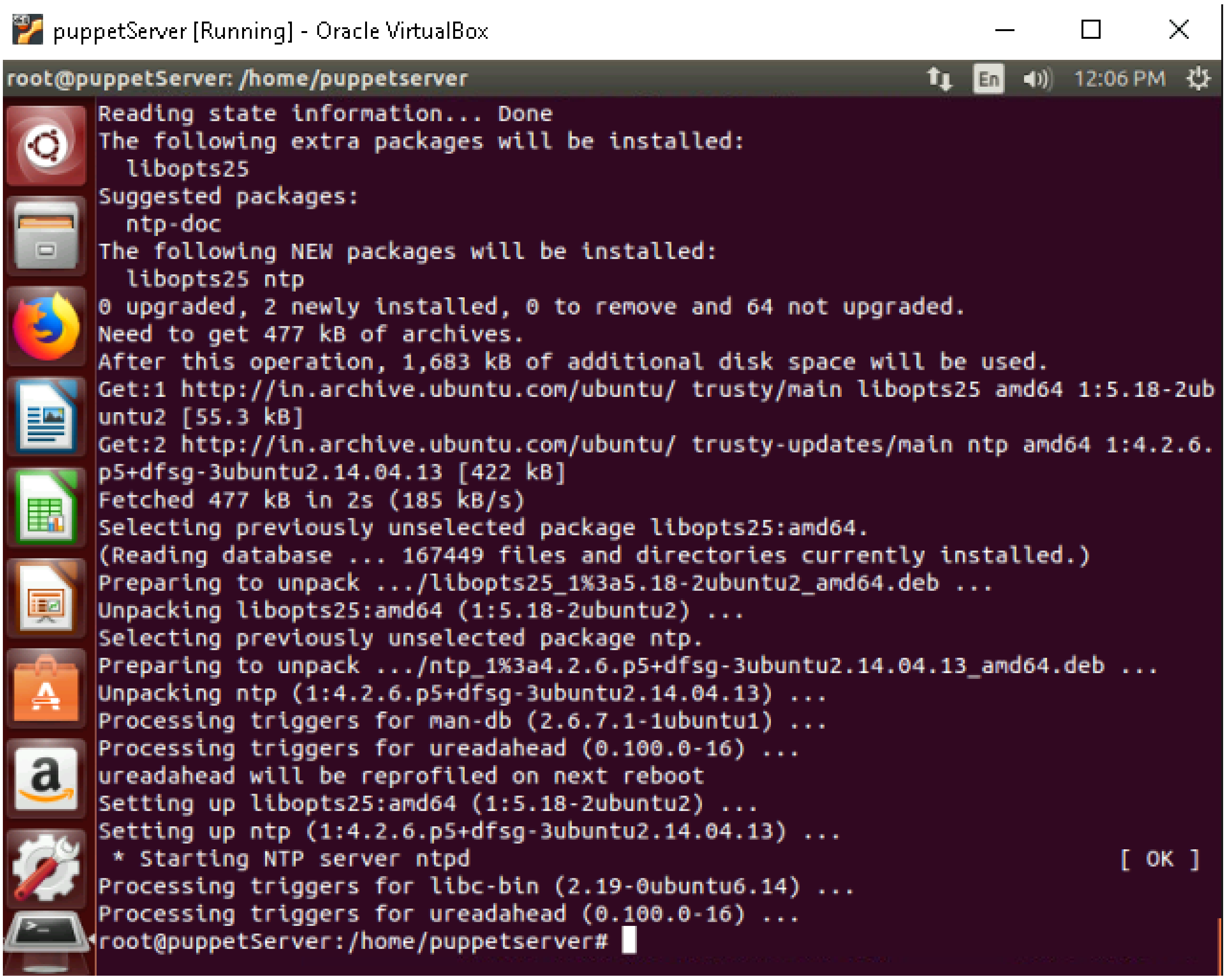
> *Purpose:* Adds the Puppet package repository for Ubuntu.

Step 6: Install and Configure Puppet Master

1. **Start NTP on Puppet Master**:

   Install the NTP package on `puppetServer`:

   ```
   apt-get -y install ntp
   ```

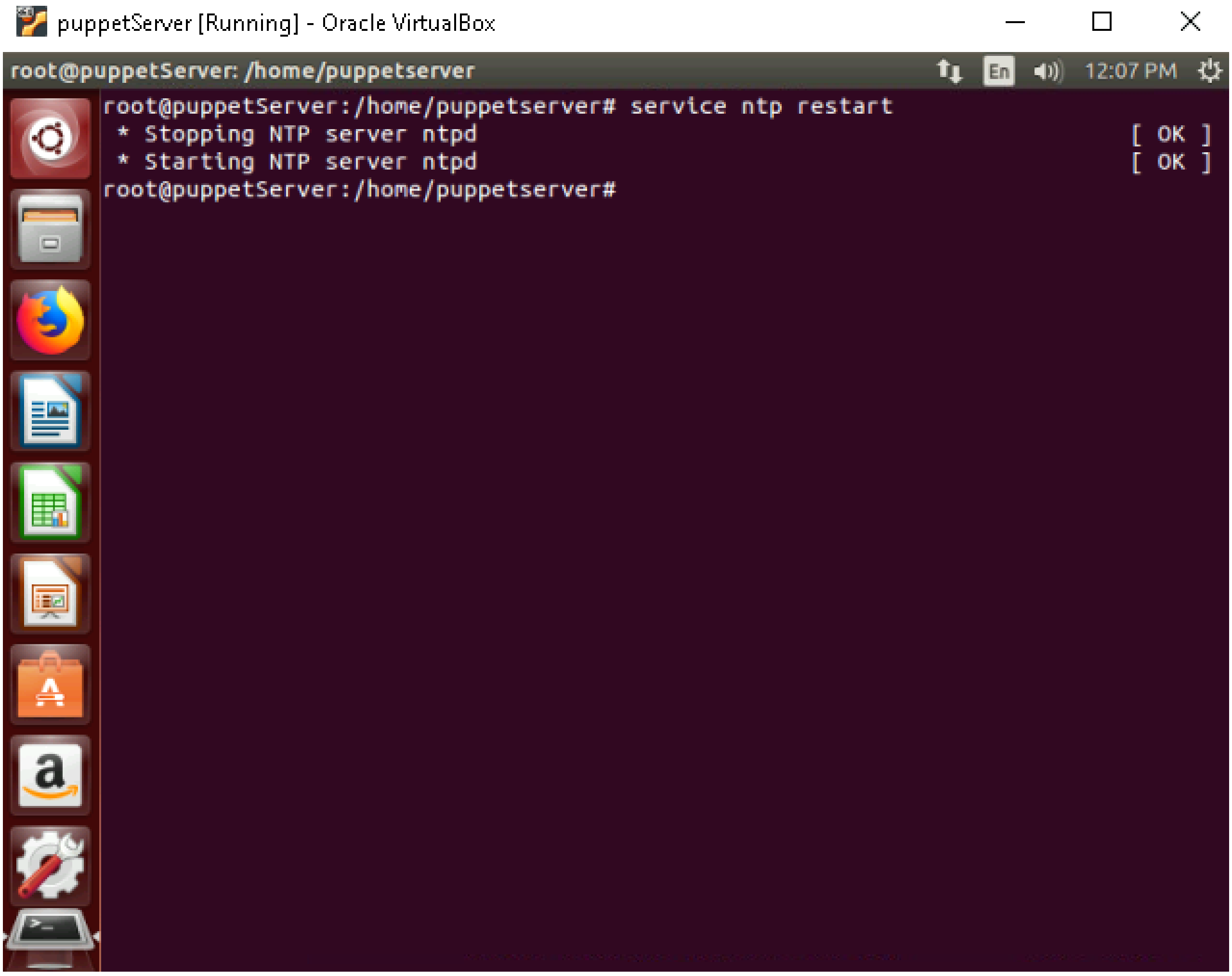


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
12:06 PM

```
Reading state information... Done
The following extra packages will be installed:
  libopts25
Suggested packages:
  ntp-doc
The following NEW packages will be installed:
  libopts25 ntp
0 upgraded, 2 newly installed, 0 to remove and 64 not upgraded.
Need to get 477 kB of archives.
After this operation, 1,683 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu/ trusty/main libopts25 amd64 1:5.18-2ub
untu2 [55.3 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu/ trusty-updates/main ntp amd64 1:4.2.6.
p5+dfsg-3ubuntu2.14.04.13 [422 kB]
Fetched 477 kB in 2s (185 kB/s)
Selecting previously unselected package libopts25:amd64.
(Reading database ... 167449 files and directories currently installed.)
Preparing to unpack .../libopts25_1%3a5.18-2ubuntu2_amd64.deb ...
Unpacking libopts25:amd64 (1:5.18-2ubuntu2) ...
Selecting previously unselected package ntp.
Preparing to unpack .../ntp_1%3a4.2.6.p5+dfsg-3ubuntu2.14.04.13_amd64.deb ...
Unpacking ntp (1:4.2.6.p5+dfsg-3ubuntu2.14.04.13) ...
Processing triggers for man-db (2.6.7.1-1ubuntu1) ...
Processing triggers for ureadahead (0.100.0-16) ...
ureadahead will be reprofiled on next reboot
Setting up libopts25:amd64 (1:5.18-2ubuntu2) ...
Setting up ntp (1:4.2.6.p5+dfsg-3ubuntu2.14.04.13) ...
 * Starting NTP server ntpd                                              [ OK ]
Processing triggers for libc-bin (2.19-0ubuntu6.14) ...
Processing triggers for ureadahead (0.100.0-16) ...
root@puppetServer:/home/puppetserver#
```

Restart the NTP service:

```
service ntp restart
```

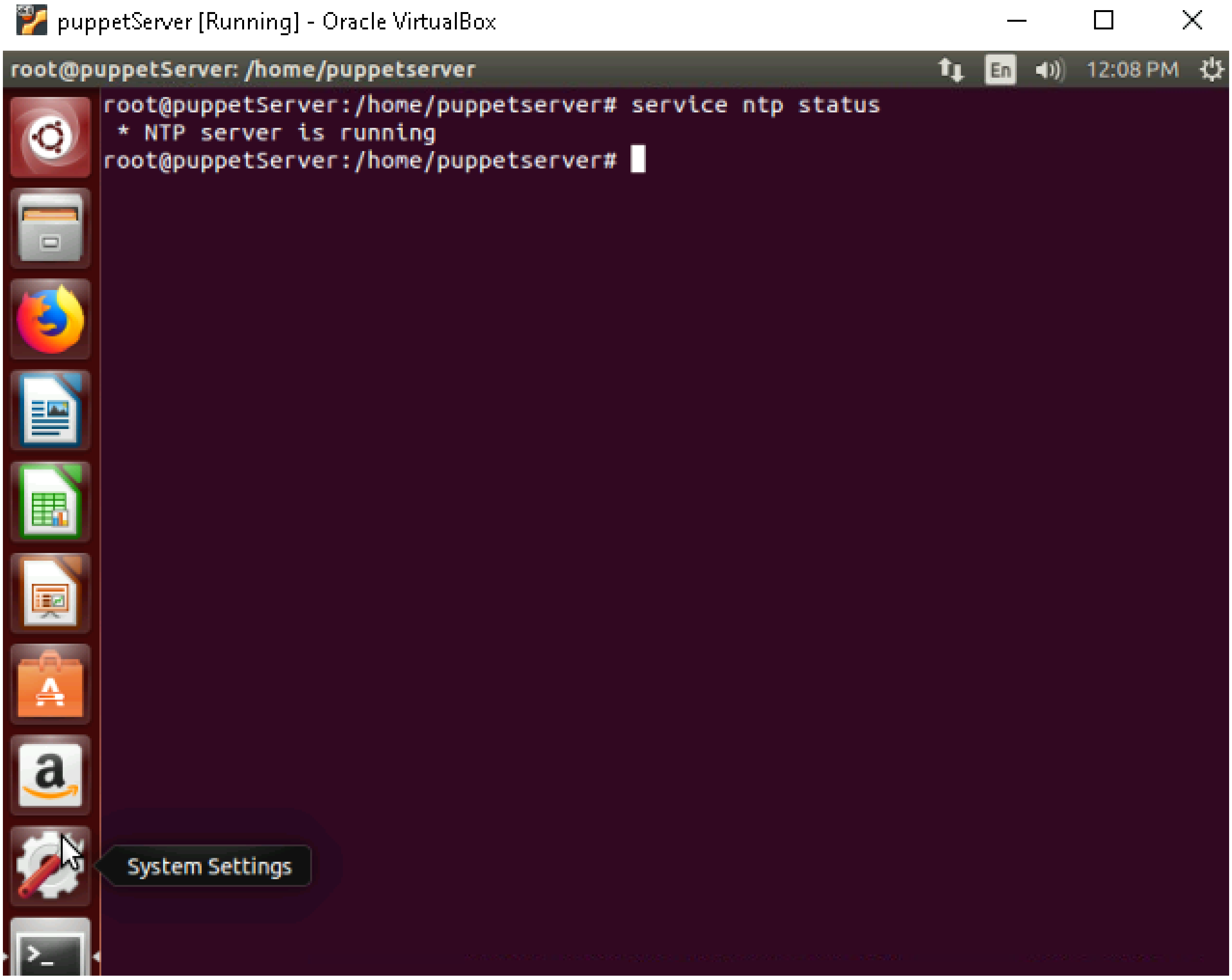


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:07 PM

```
root@puppetServer:/home/puppetserver# service ntp restart
 * Stopping NTP server ntpd                                            [ OK ]
 * Starting NTP server ntpd                                            [ OK ]
root@puppetServer:/home/puppetserver#
```

Check the NTP status:

```
service ntp status
```



puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:08 PM
System Settings

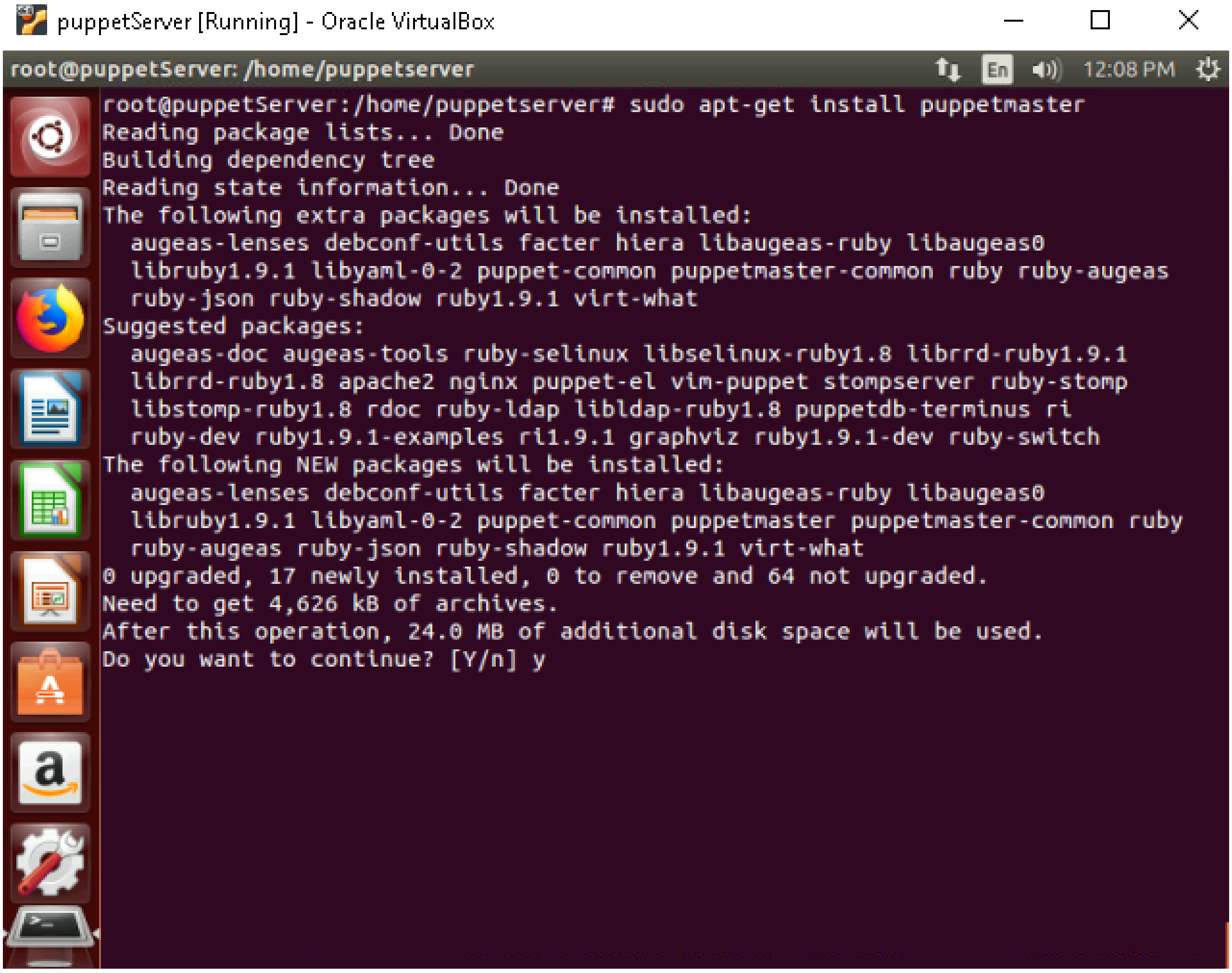
```
root@puppetServer:/home/puppetserver# service ntp status
 * NTP server is running
root@puppetServer:/home/puppetserver# 
```

> *Purpose:* Ensures that the system time is synchronized between the Puppet Master and Agent.

2. **Install Puppet Master**:

   Install the Puppet Master package on `puppetServer`:

   ```
   sudo apt-get install puppetmaster
   ```



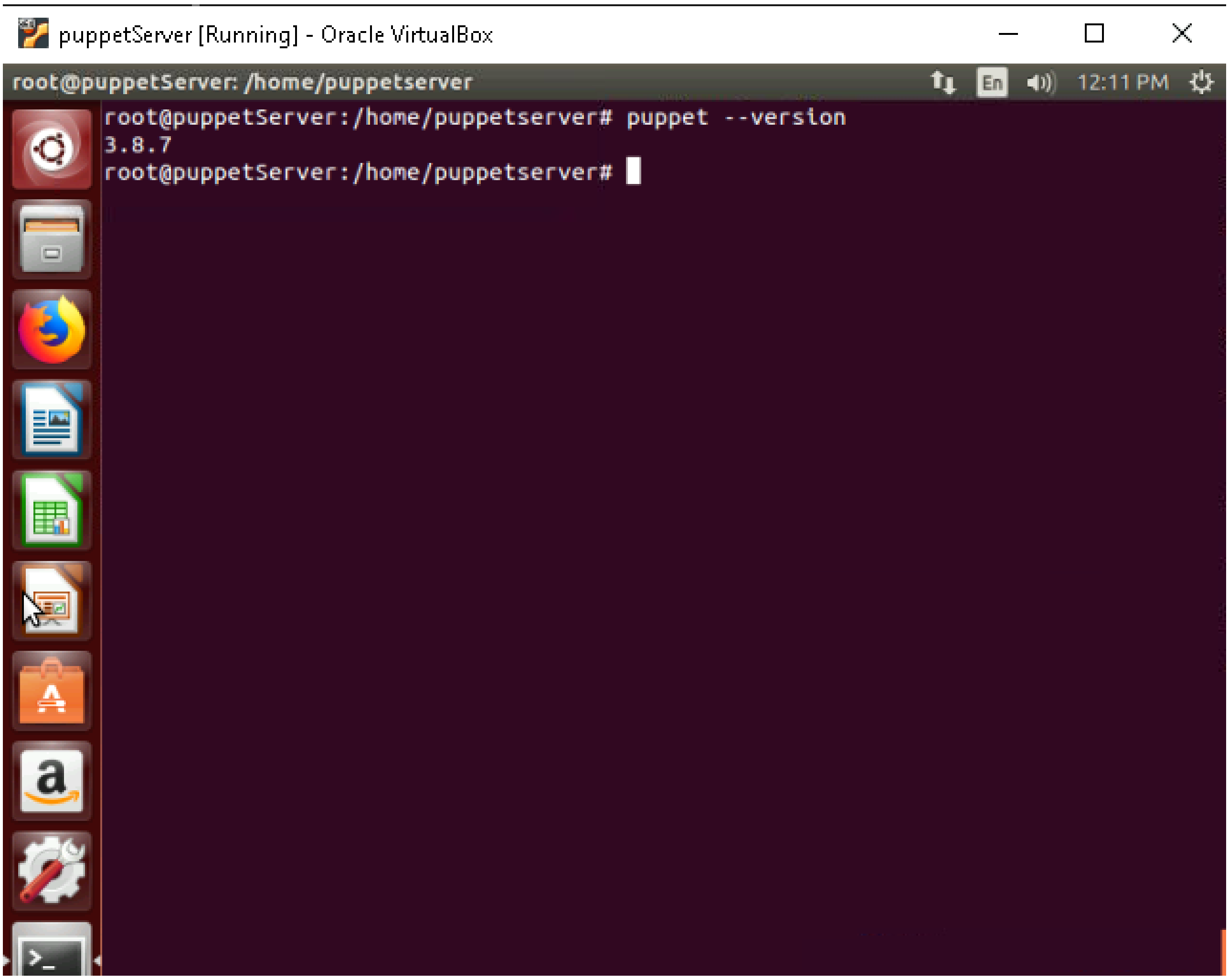
puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:08 PM

```
root@puppetServer:/home/puppetserver# sudo apt-get install puppetmaster
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  augeas-lenses debconf-utils facter hiera libaugeas-ruby libaugeas0
  libruby1.9.1 libyaml-0-2 puppet-common puppetmaster-common ruby ruby-augeas
  ruby-json ruby-shadow ruby1.9.1 virt-what
Suggested packages:
  augeas-doc augeas-tools ruby-selinux libselinux-ruby1.8 librrd-ruby1.9.1
  librrd-ruby1.8 apache2 nginx puppet-el vim-puppet stompserver ruby-stomp
  libstomp-ruby1.8 rdoc ruby-ldap libldap-ruby1.8 puppetdb-terminus ri
  ruby-dev ruby1.9.1-examples ri1.9.1 graphviz ruby1.9.1-dev ruby-switch
The following NEW packages will be installed:
  augeas-lenses debconf-utils facter hiera libaugeas-ruby libaugeas0
  libruby1.9.1 libyaml-0-2 puppet-common puppetmaster puppetmaster-common ruby
  ruby-augeas ruby-json ruby-shadow ruby1.9.1 virt-what
0 upgraded, 17 newly installed, 0 to remove and 64 not upgraded.
Need to get 4,626 kB of archives.
After this operation, 24.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

3. **Verify Installation**:

   Check the Puppet version by running the following command on `puppetServer`:

   ```
   puppet --version
   ```



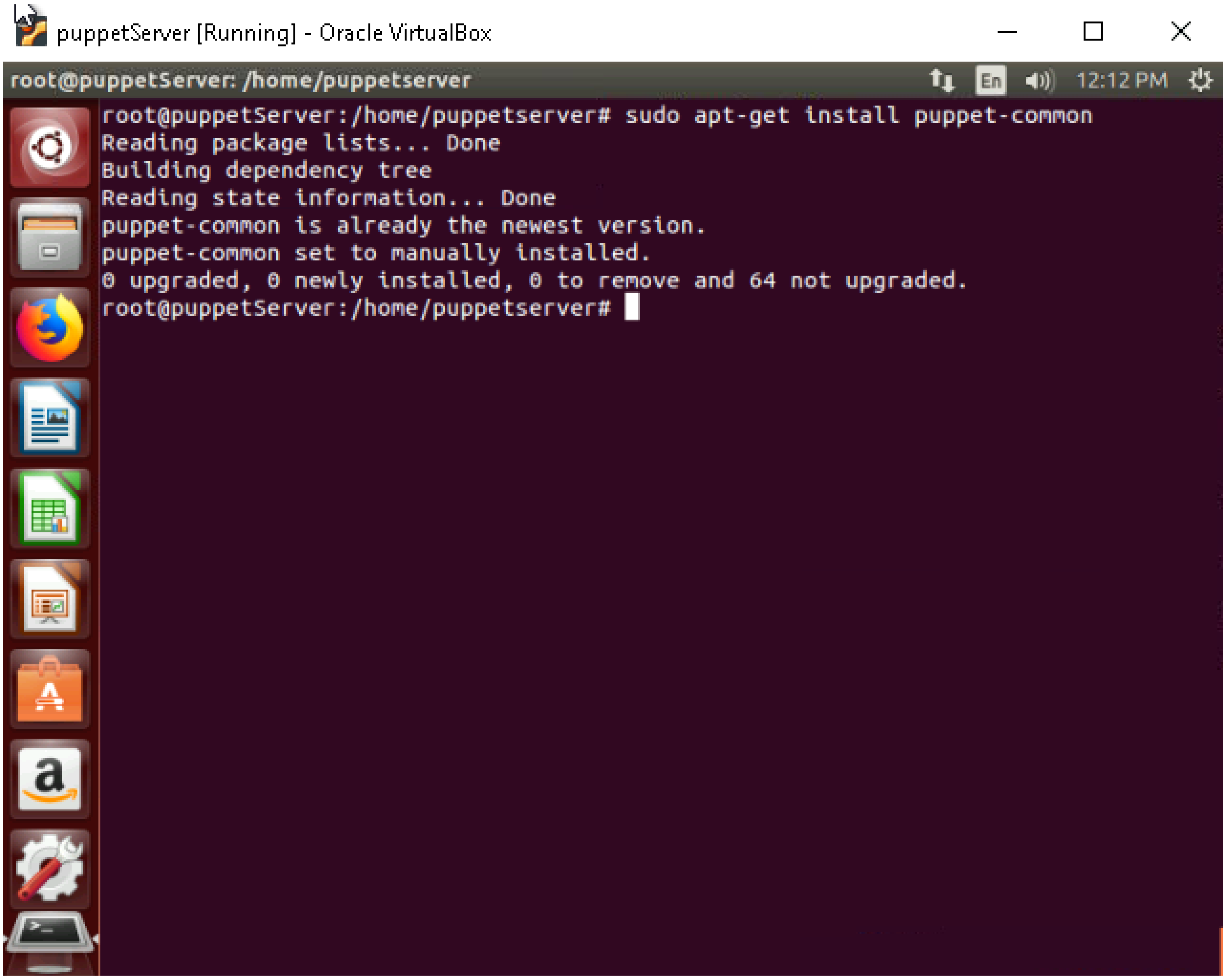
puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:11 PM

```
root@puppetServer:/home/puppetserver# puppet --version
3.8.7
root@puppetServer:/home/puppetserver# 
```

> *Purpose:* Confirms that Puppet Master is installed successfully.

4. **Install the Puppet common with the following command**:

```
sudo apt-get install puppet-common
```


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:12 PM

```
root@puppetServer:/home/puppetserver# sudo apt-get install puppet-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
puppet-common is already the newest version.
puppet-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 64 not upgraded.
root@puppetServer:/home/puppetserver#
```

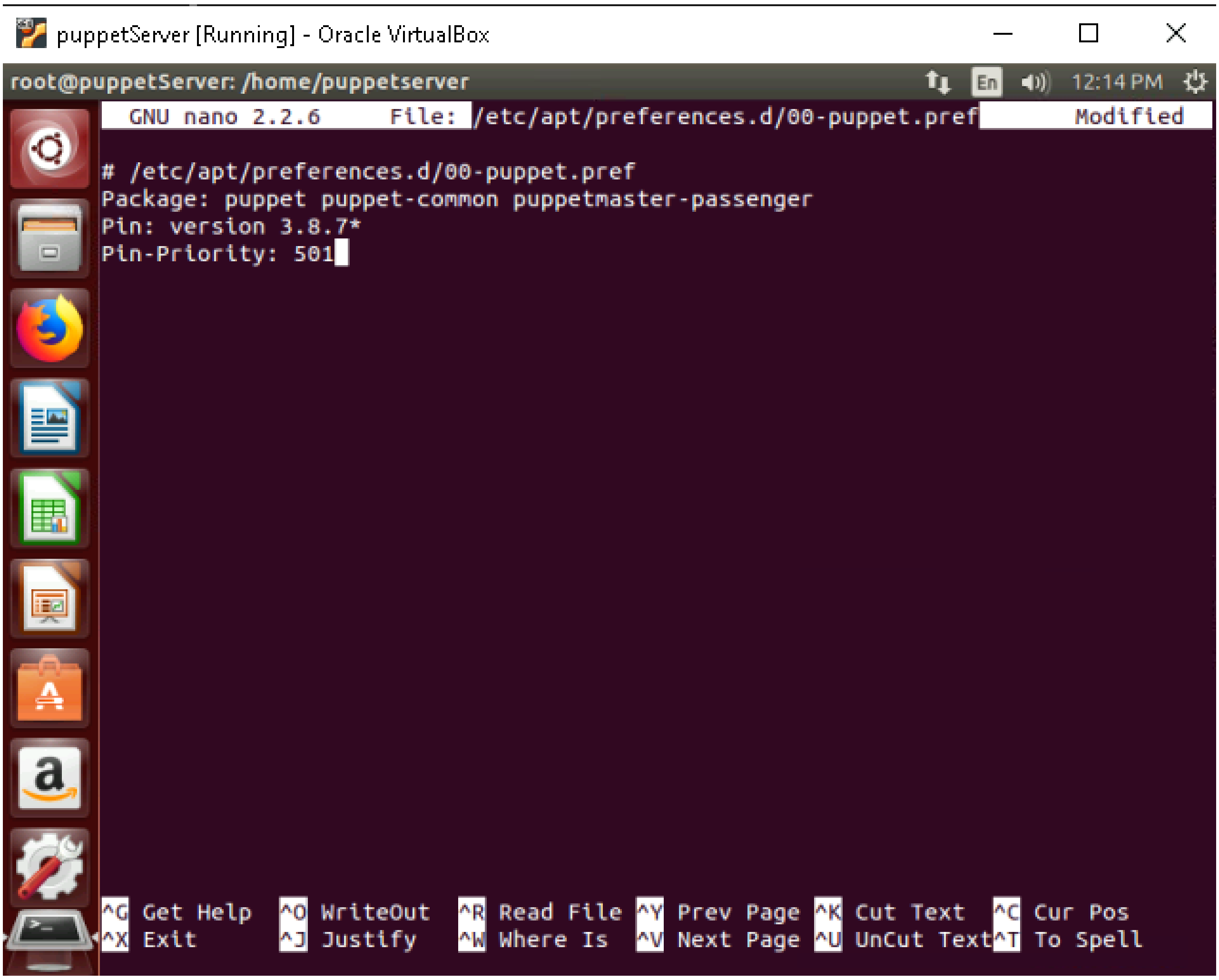
5. **Lock Puppet Version**:

   To prevent Puppet from being upgraded during system updates, create a preferences file using the following command:

   ```
   sudo nano /etc/apt/preferences.d/00-puppet.pref
   ```

   Add the following configurations in the file (replace `3.8.7` with your Puppet version):

   ```
   # /etc/apt/preferences.d/00-puppet.pref
   Package: puppet puppet-common puppetmaster-passenger
   Pin: version 3.8.7*
   Pin-Priority: 501
   ```


puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:14 PM

```
  GNU nano 2.2.6        File: /etc/apt/preferences.d/00-puppet.pref          Modified

# /etc/apt/preferences.d/00-puppet.pref
Package: puppet puppet-common puppetmaster-passenger
Pin: version 3.8.7*
Pin-Priority: 501

^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

> *Purpose:* Ensures that the Puppet version remains consistent and prevents unexpected issues due to upgrades.

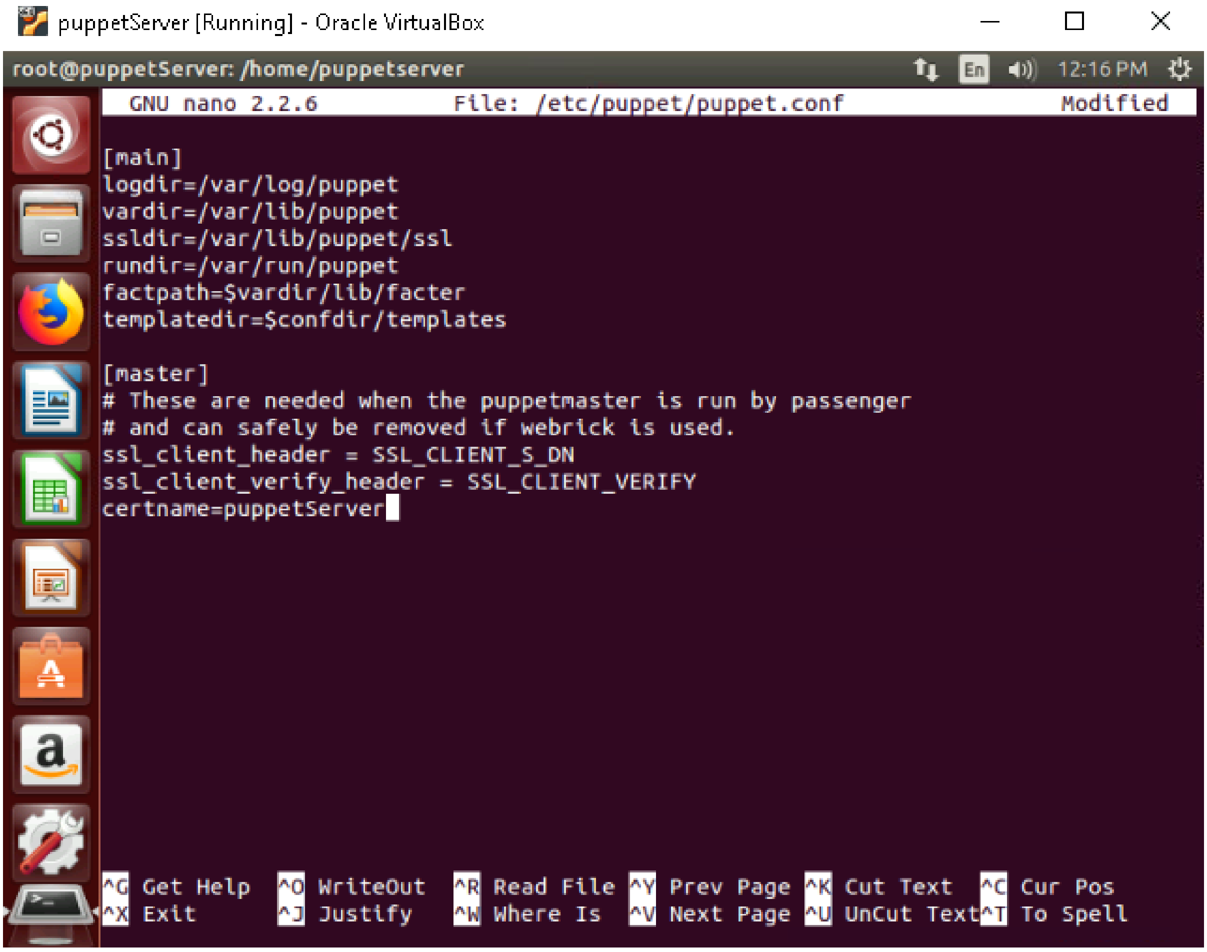
6. **Configure Puppet Master**:

   - Edit the configuration file:

     ```
     sudo nano /etc/puppet/puppet.conf
     ```

     Add:

     ```
     [main]
     ssldir = /var/lib/puppet/ssl
     logdir = /var/log/puppet
     rundir = /var/run/puppet

     [master]
     certname = puppetServer
     ```

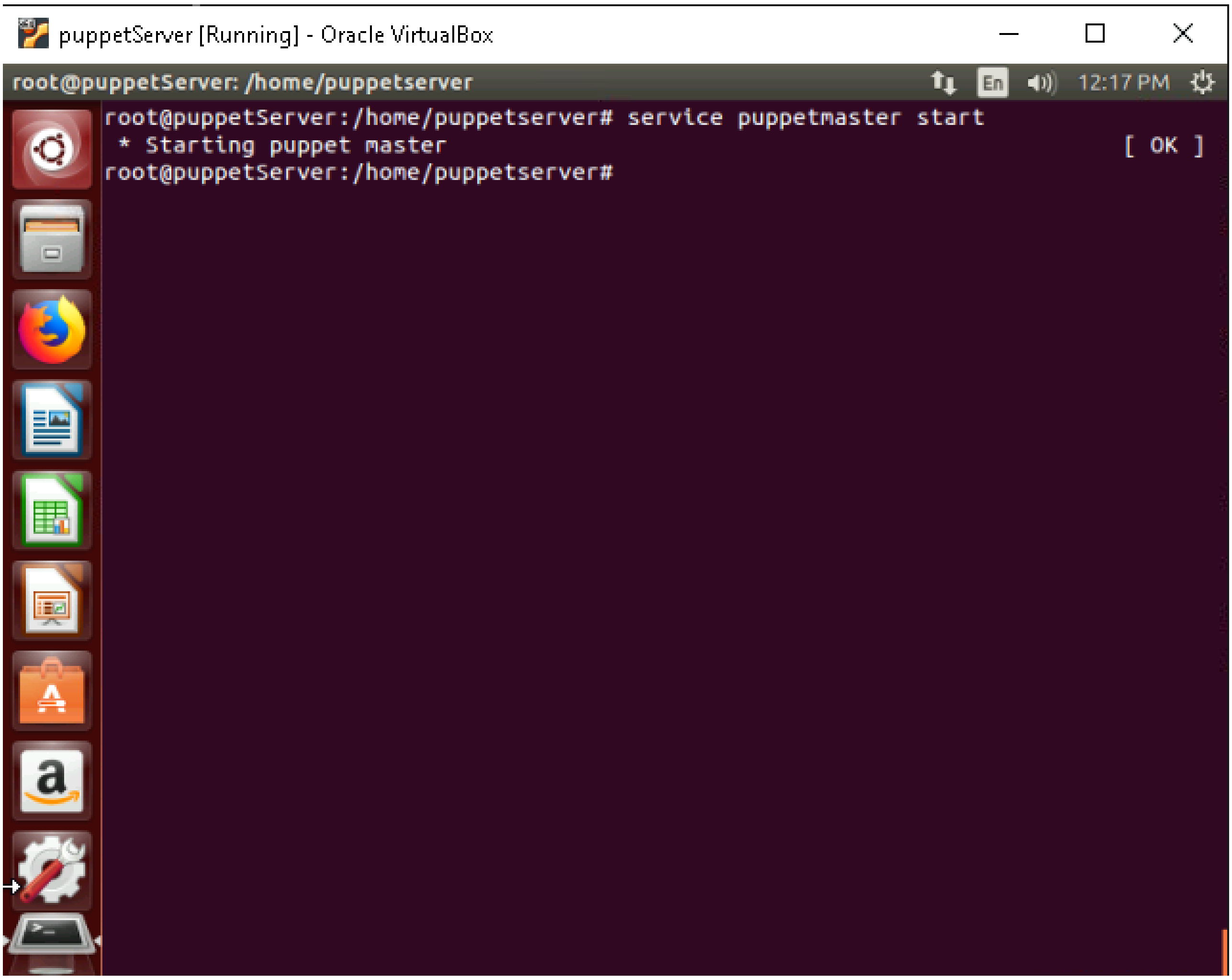

puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
12:16 PM

```
  GNU nano 2.2.6            File: /etc/puppet/puppet.conf                Modified

[main]
logdir=/var/log/puppet
vardir=/var/lib/puppet
ssldir=/var/lib/puppet/ssl
rundir=/var/run/puppet
factpath=$vardir/lib/facter
templatedir=$confdir/templates

[master]
# These are needed when the puppetmaster is run by passenger
# and can safely be removed if webrick is used.
ssl_client_header = SSL_CLIENT_S_DN
ssl_client_verify_header = SSL_CLIENT_VERIFY
certname=puppetServer

^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

> *Purpose:* Configures Puppet Master settings.

7. **Start Puppet Master Service**:

```
sudo service puppetmaster start
```



puppetServer [Running] - Oracle VirtualBox
root@puppetServer: /home/puppetserver
En
12:17 PM

```
root@puppetServer:/home/puppetserver# service puppetmaster start
 * Starting puppet master                                                [ OK ]
root@puppetServer:/home/puppetserver#
```

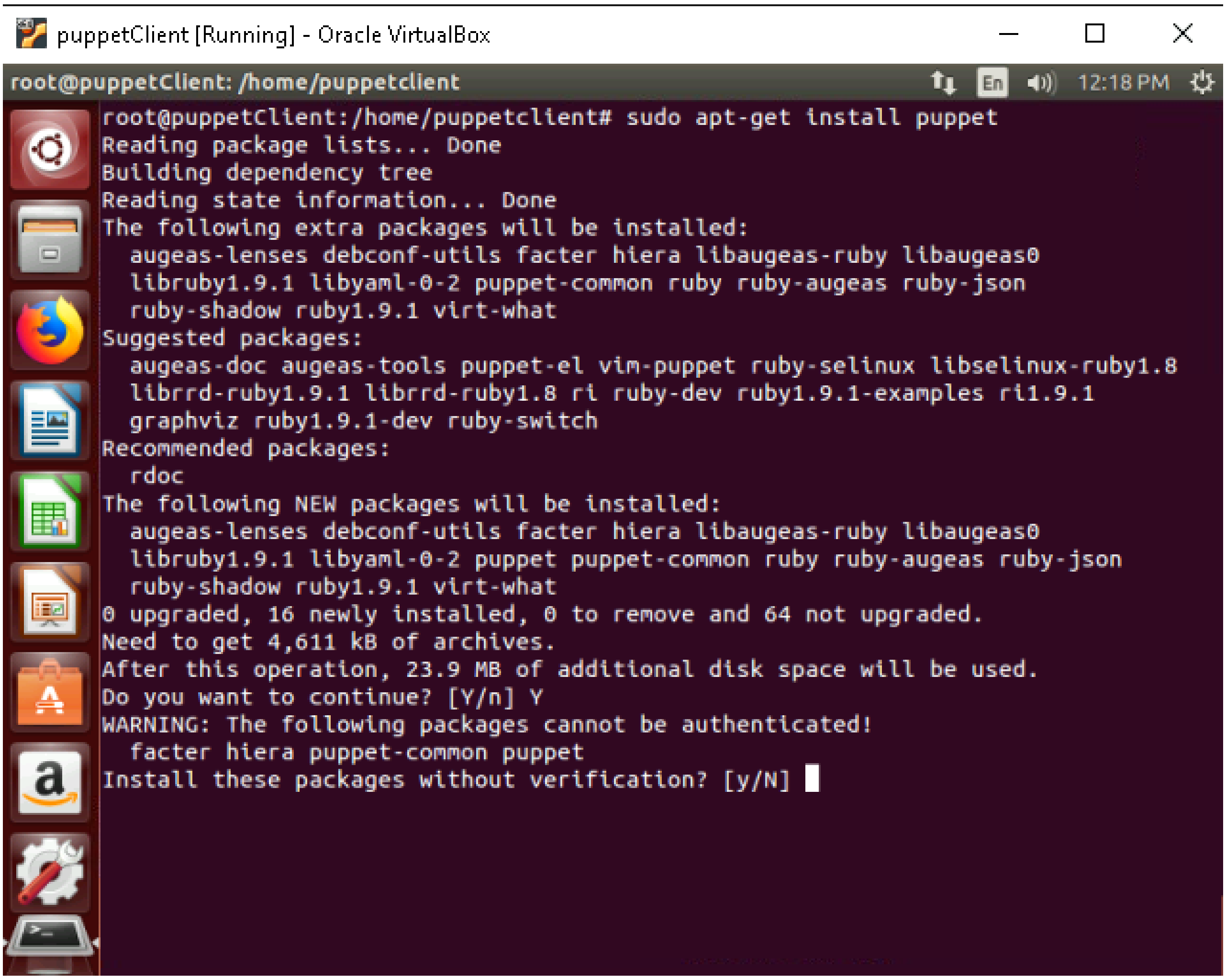
> *Purpose:* Initiates the Puppet Master service.

Step 7: Install and Configure Puppet Agent

1. **Install Puppet Agent**:

   Install the Puppet Agent package on `puppetClient`:

   ```
   sudo apt-get install puppet
   ```

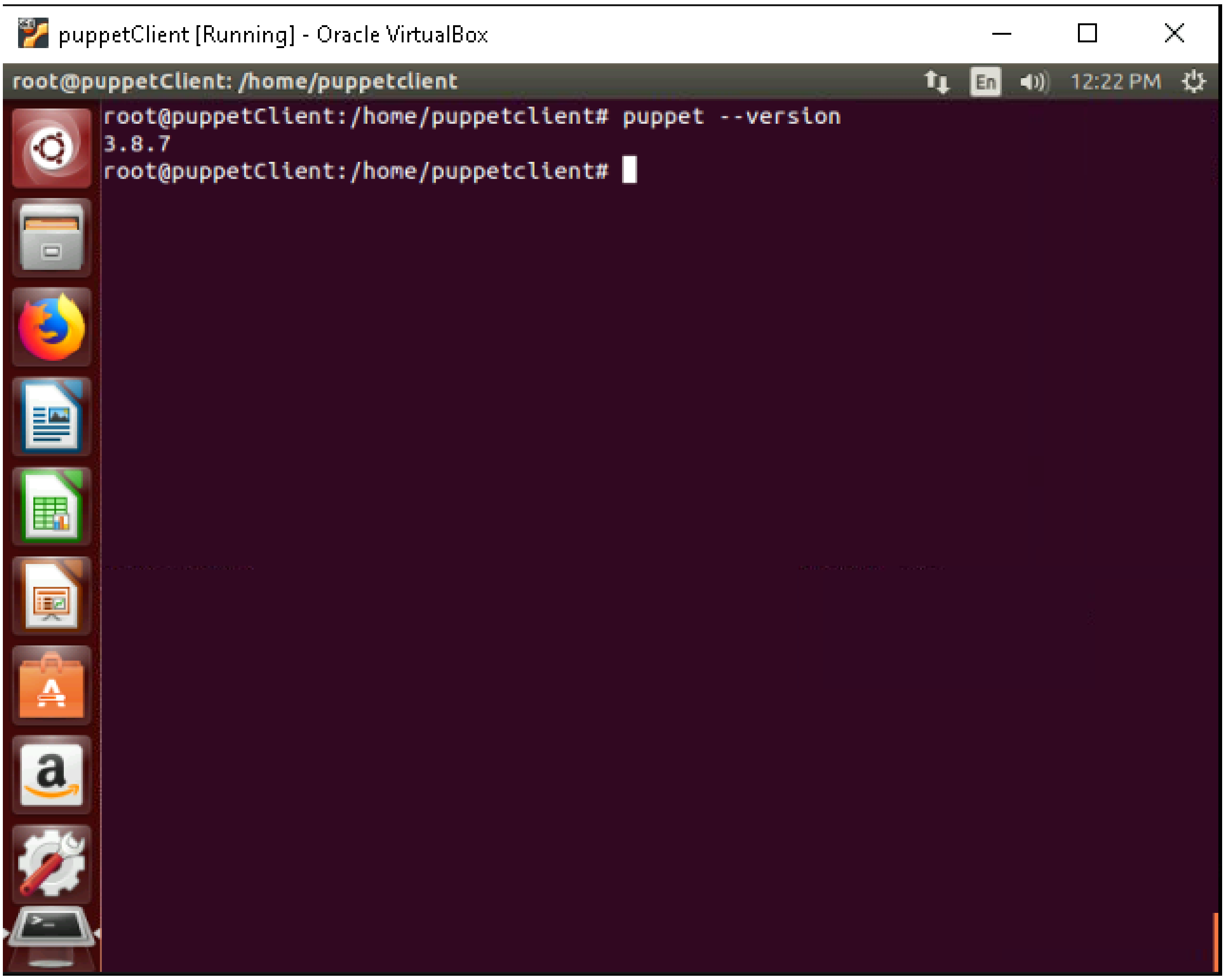


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
En
12:18 PM

```
root@puppetClient:/home/puppetclient# sudo apt-get install puppet
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  augeas-lenses debconf-utils facter hiera libaugeas-ruby libaugeas0
  libruby1.9.1 libyaml-0-2 puppet-common ruby ruby-augeas ruby-json
  ruby-shadow ruby1.9.1 virt-what
Suggested packages:
  augeas-doc augeas-tools puppet-el vim-puppet ruby-selinux libselinux-ruby1.8
  librrd-ruby1.9.1 librrd-ruby1.8 ri ruby-dev ruby1.9.1-examples ri1.9.1
  graphviz ruby1.9.1-dev ruby-switch
Recommended packages:
  rdoc
The following NEW packages will be installed:
  augeas-lenses debconf-utils facter hiera libaugeas-ruby libaugeas0
  libruby1.9.1 libyaml-0-2 puppet puppet-common ruby ruby-augeas ruby-json
  ruby-shadow ruby1.9.1 virt-what
0 upgraded, 16 newly installed, 0 to remove and 64 not upgraded.
Need to get 4,611 kB of archives.
After this operation, 23.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
WARNING: The following packages cannot be authenticated!
  facter hiera puppet-common puppet
Install these packages without verification? [y/N]
```

2. Puppet version can be checked by running the following command:

```
puppet --version
```


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:22 PM

```
root@puppetClient:/home/puppetclient# puppet --version
3.8.7
root@puppetClient:/home/puppetclient# 
```

> *Purpose:* Confirms that Puppet Agent is installed successfully.

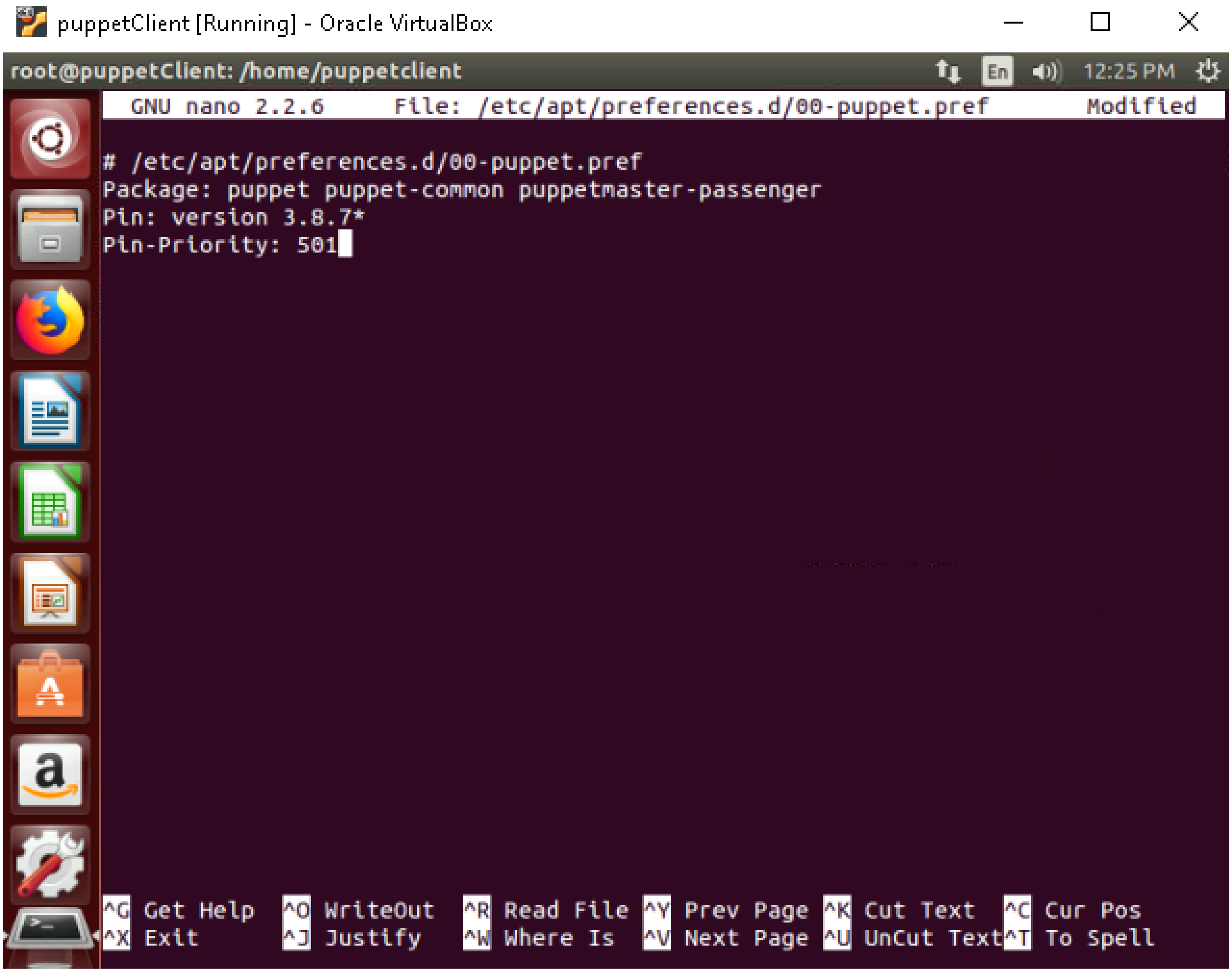
3. **Lock Puppet Version**

   To prevent Puppet from being upgraded during system updates, create a preferences file using the following command:

   ```
   sudo nano /etc/apt/preferences.d/00-puppet.pref
   ```

   Add the following configurations in the file (replace `3.8.7` with your Puppet version):

   ```
   # /etc/apt/preferences.d/00-puppet.pref
   Package: puppet puppet-common puppetmaster-passenger
   Pin: version 3.8.7*
   Pin-Priority: 501
   ```


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:25 PM

```
  GNU nano 2.2.6       File: /etc/apt/preferences.d/00-puppet.pref       Modified

# /etc/apt/preferences.d/00-puppet.pref
Package: puppet puppet-common puppetmaster-passenger
Pin: version 3.8.7*
Pin-Priority: 501
```

> *Purpose:* Ensures that the Puppet version remains consistent and prevents unexpected issues due to upgrades.

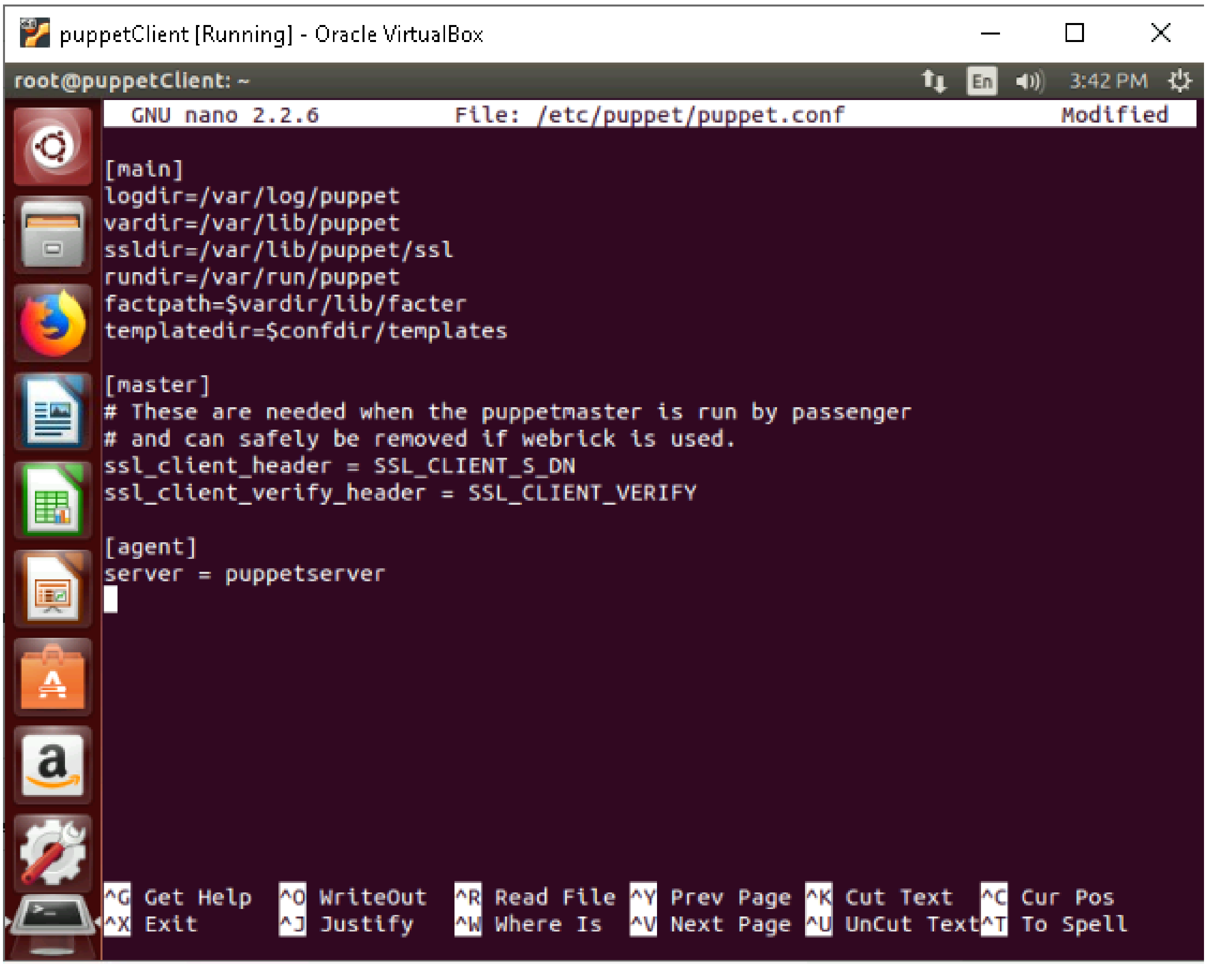
4. **Configure Puppet Agent**:

   - Edit the Puppet configuration file:

     ```
     sudo nano /etc/puppet/puppet.conf
     ```

     Add:

     ```
     [main]
     ssldir = /var/lib/puppet/ssl
     vardir = /var/lib/puppet
     logdir = /var/log/puppet
     rundir = /var/run/puppet

     [agent]
     server = puppetserver
     ```



```
  GNU nano 2.2.6            File: /etc/puppet/puppet.conf              Modified

[main]
logdir=/var/log/puppet
vardir=/var/lib/puppet
ssldir=/var/lib/puppet/ssl
rundir=/var/run/puppet
factpath=$vardir/lib/facter
templatedir=$confdir/templates

[master]
# These are needed when the puppetmaster is run by passenger
# and can safely be removed if webrick is used.
ssl_client_header = SSL_CLIENT_S_DN
ssl_client_verify_header = SSL_CLIENT_VERIFY

[agent]
server = puppetserver

^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

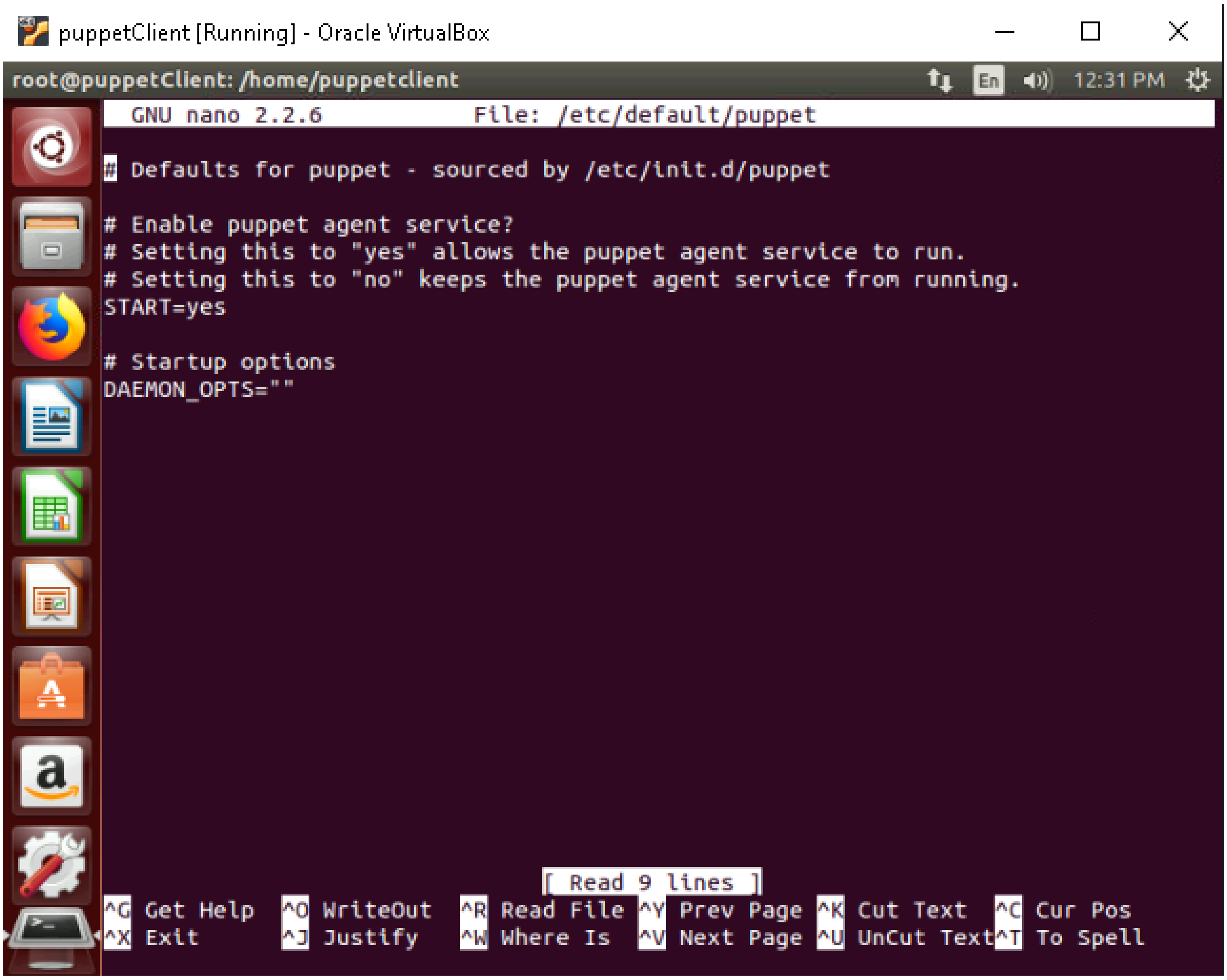
> *Purpose:* Configures Puppet Agent settings.

5. **Start Puppet Agent Service**:

   Edit the `/etc/default/puppet` file to enable the Puppet Agent service:

   ```
   sudo nano /etc/default/puppet
   ```

   Set `START=yes` in the file.

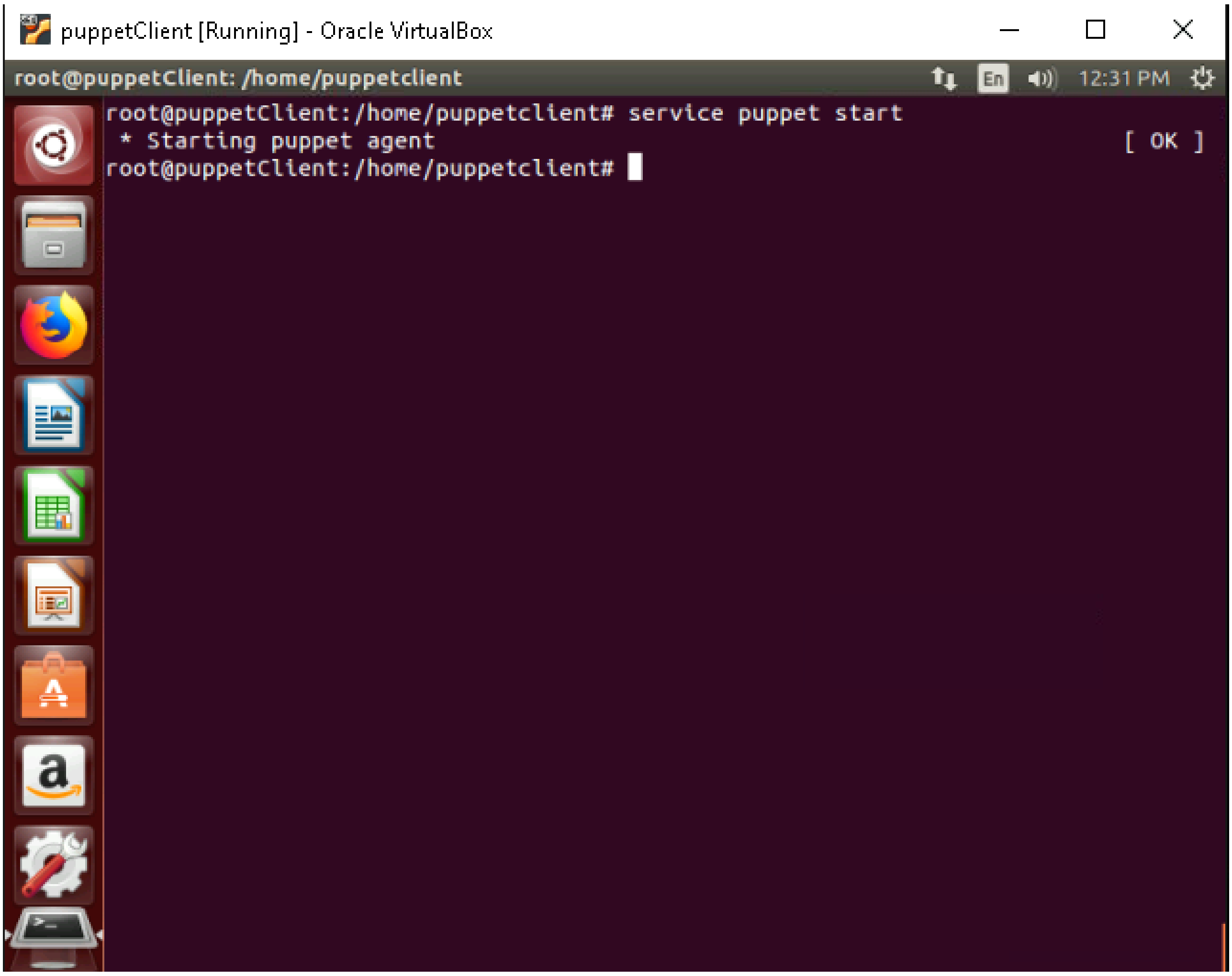


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:31 PM

```
  GNU nano 2.2.6             File: /etc/default/puppet

# Defaults for puppet - sourced by /etc/init.d/puppet

# Enable puppet agent service?
# Setting this to "yes" allows the puppet agent service to run.
# Setting this to "no" keeps the puppet agent service from running.
START=yes

# Startup options
DAEMON_OPTS=""

                                [ Read 9 lines ]
^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

Run the following command on `puppetClient`:

```
service puppet start
```


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
12:31 PM

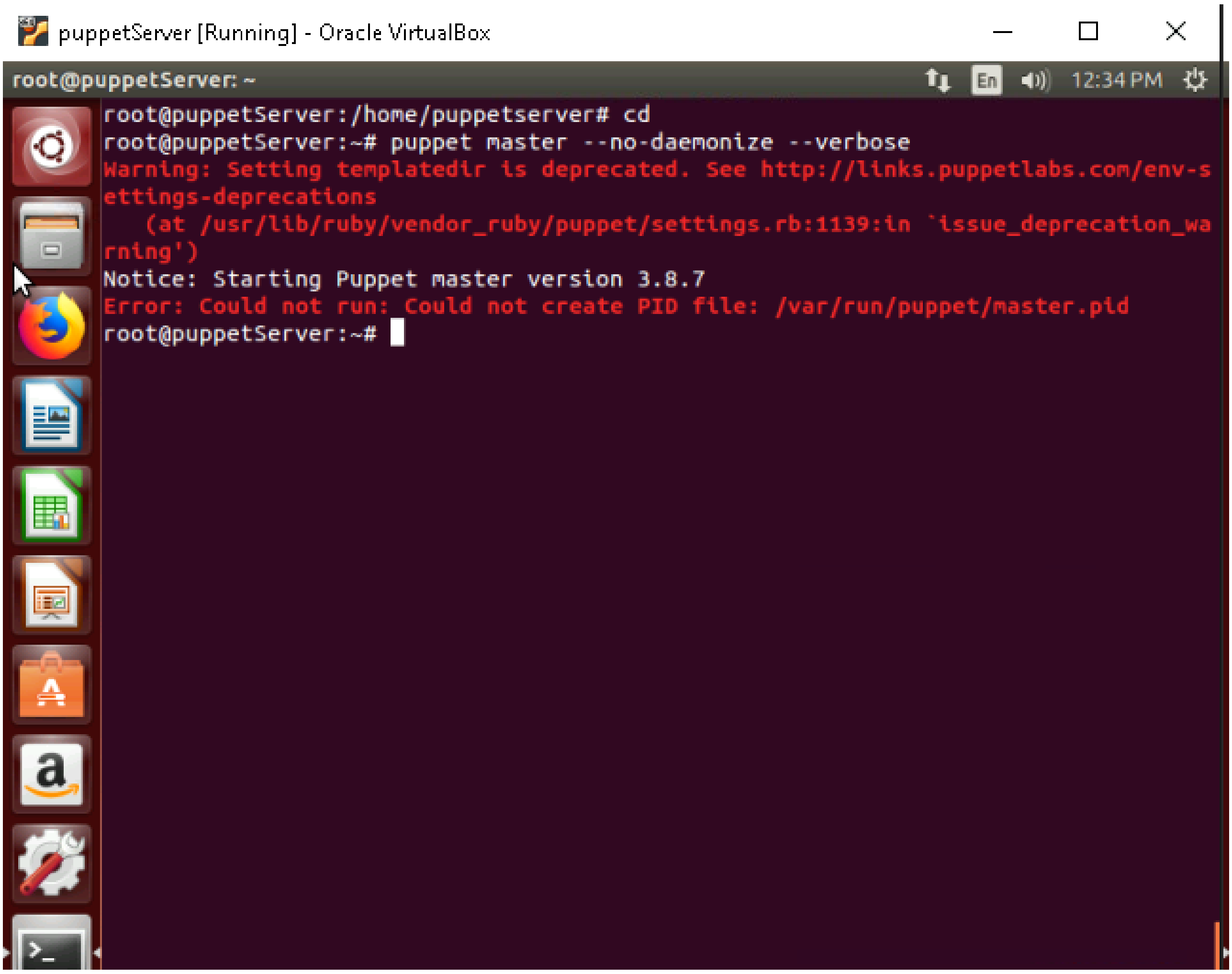
```
root@puppetClient:/home/puppetclient# service puppet start
 * Starting puppet agent                                                 [ OK ]
root@puppetClient:/home/puppetclient# 
```

Step 8: Establish Secure Communication Between Puppet Master and Agent

1. **Start Puppet Master in No-Daemonize Mode**:

   On `puppetServer`, run the following command to create the CA certificate and a Puppet Master certificate:

   ```
   puppet master --no-daemonize --verbose
   ```



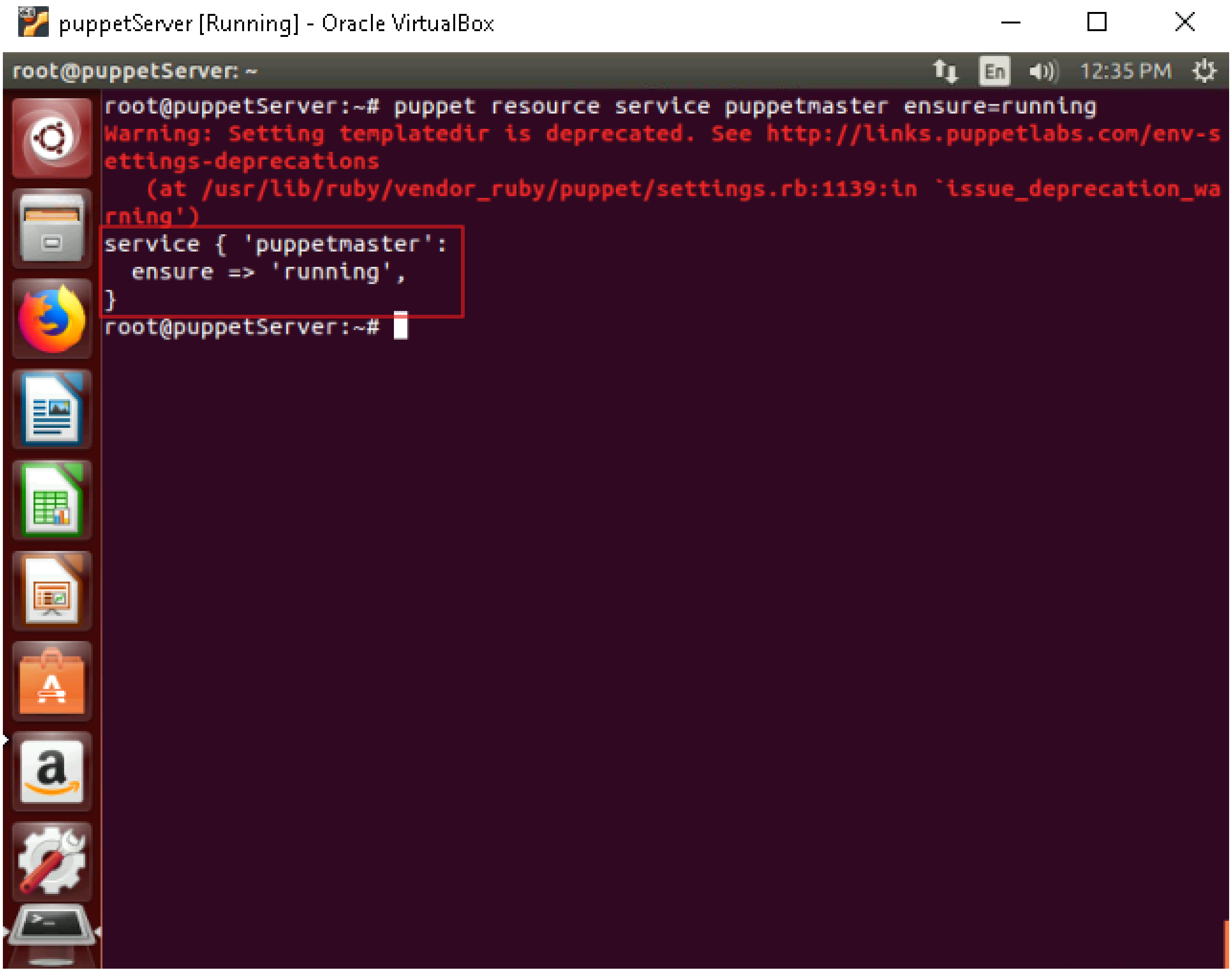
```
root@puppetServer:/home/puppetserver# cd
root@puppetServer:~# puppet master --no-daemonize --verbose
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-s
ettings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_wa
rning')
Notice: Starting Puppet master version 3.8.7
Error: Could not run: Could not create PID file: /var/run/puppet/master.pid
root@puppetServer:~# 
```

> *Note:* Ignore the warning message and press `Ctrl+C` once you see the "Notice: Starting Puppet master version 5.4.0" message.

2. **Start and Enable Puppet Master Service**:

   Start the Puppet Master service:

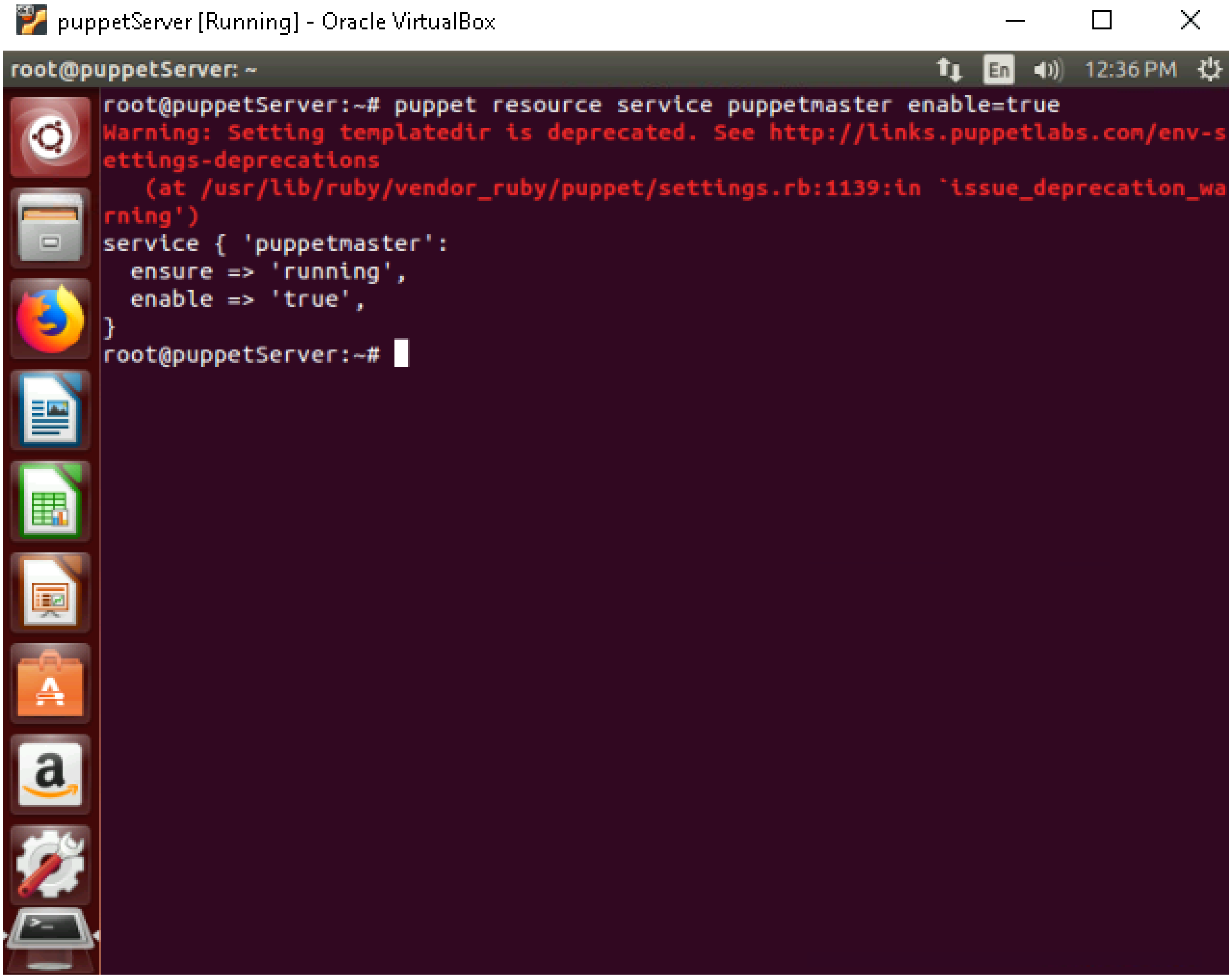
   ```
   puppet resource service puppetmaster ensure=running
   ```



```
root@puppetServer:~# puppet resource service puppetmaster ensure=running
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
service { 'puppetmaster':
  ensure => 'running',
}
root@puppetServer:~#
```

Enable the Puppet Master service to start on boot:

```
puppet resource service puppetmaster enable=true
```



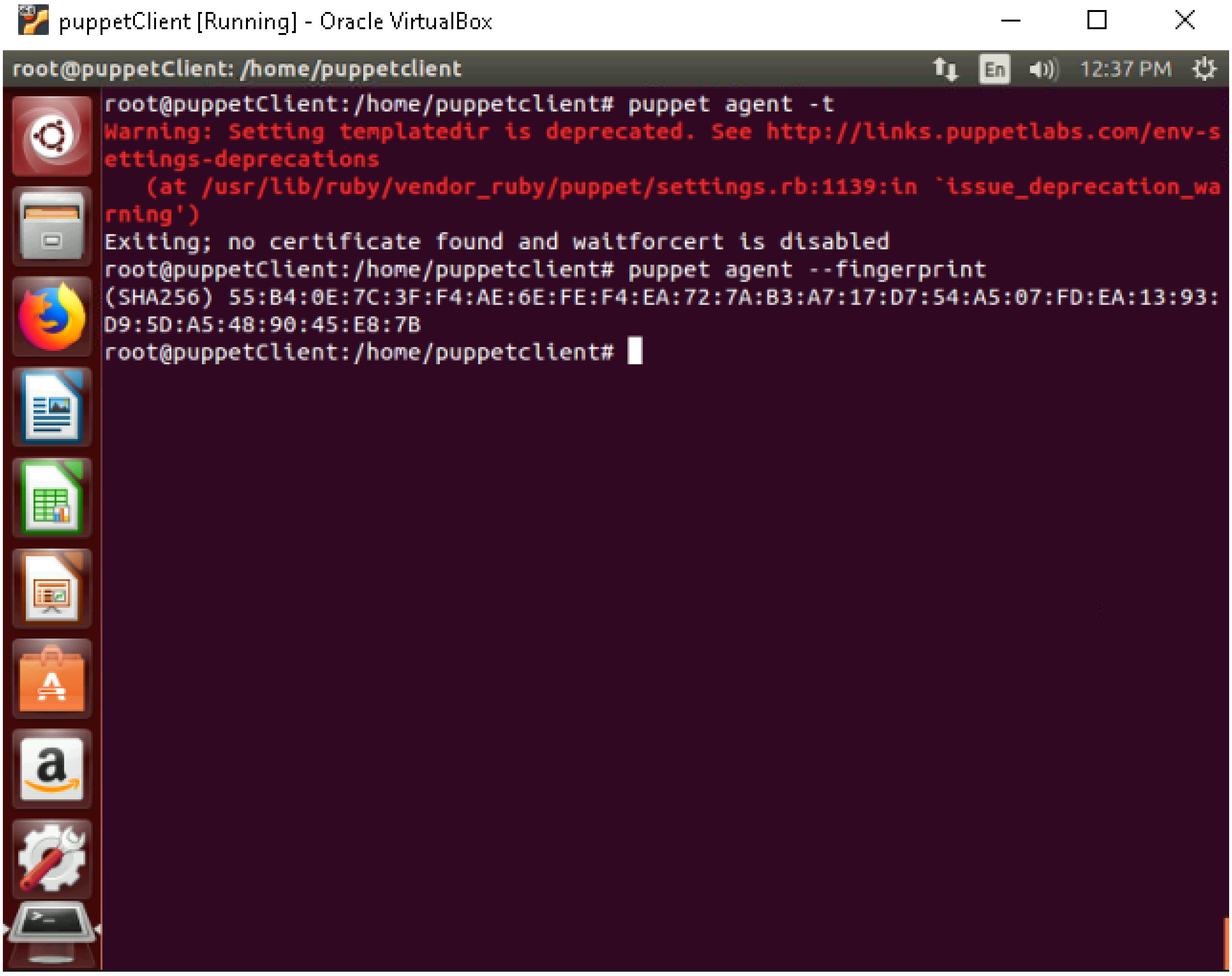
```
root@puppetServer:~# puppet resource service puppetmaster enable=true
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
service { 'puppetmaster':
  ensure => 'running',
  enable => 'true',
}
root@puppetServer:~#
```

3. **Send Certificate Signing Request from Puppet Agent**:

   On `puppetClient`, send the certificate signing request to the Puppet Master:

   ```
   puppet agent -t
   ```

   ```
   puppet agent --fingerprint
   ```



puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
En
12:37 PM

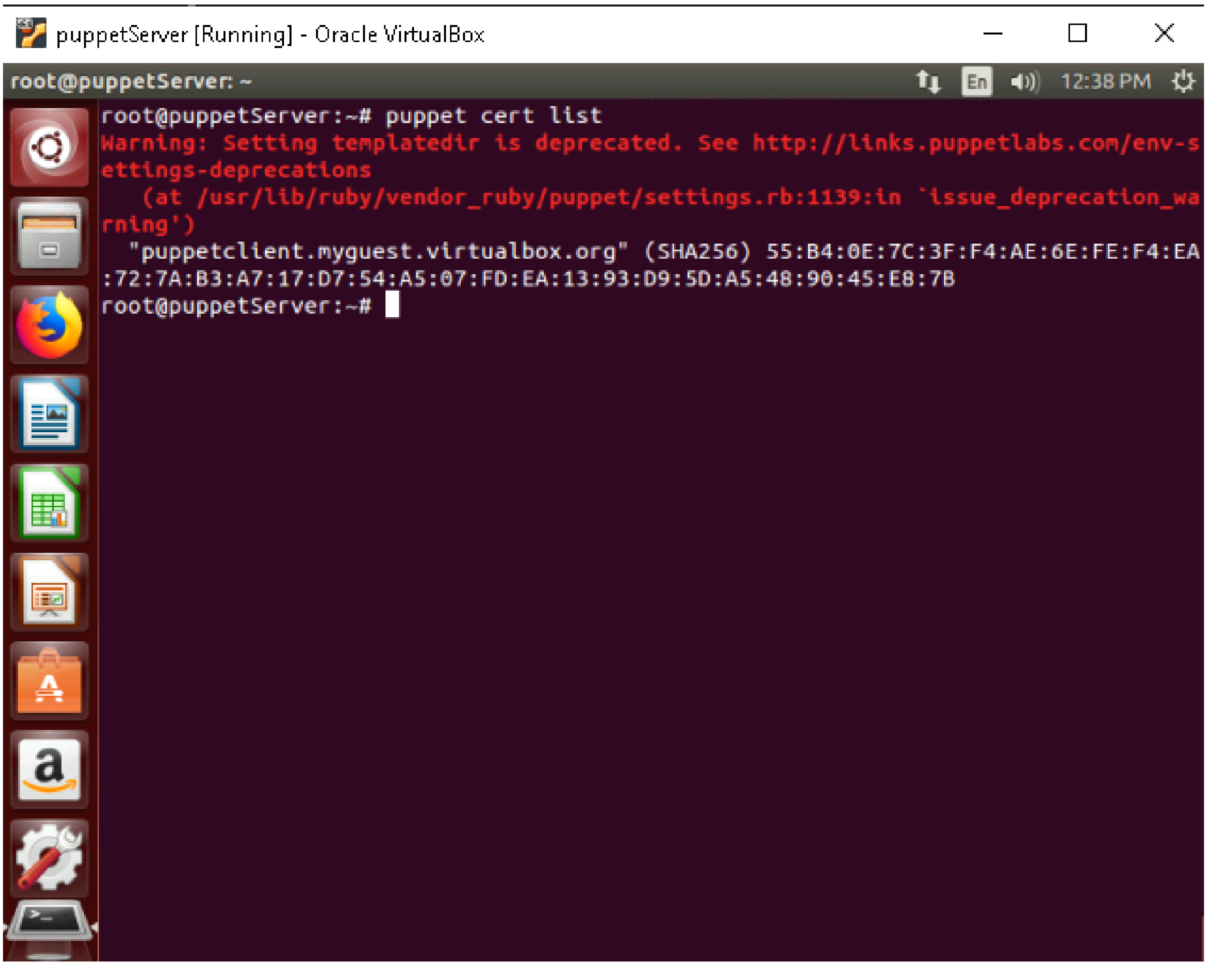
```
root@puppetClient:/home/puppetclient# puppet agent -t
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
Exiting; no certificate found and waitforcert is disabled
root@puppetClient:/home/puppetclient# puppet agent --fingerprint
(SHA256) 55:B4:0E:7C:3F:F4:AE:6E:FE:F4:EA:72:7A:B3:A7:17:D7:54:A5:07:FD:EA:13:93:D9:5D:A5:48:90:45:E8:7B
root@puppetClient:/home/puppetclient#
```

> *Purpose:* Ensures that the Puppet Agent requests a certificate from the Puppet Master.

4. **Sign the Certificate on Puppet Master**:

   On `puppetServer`, list the pending certificate requests:

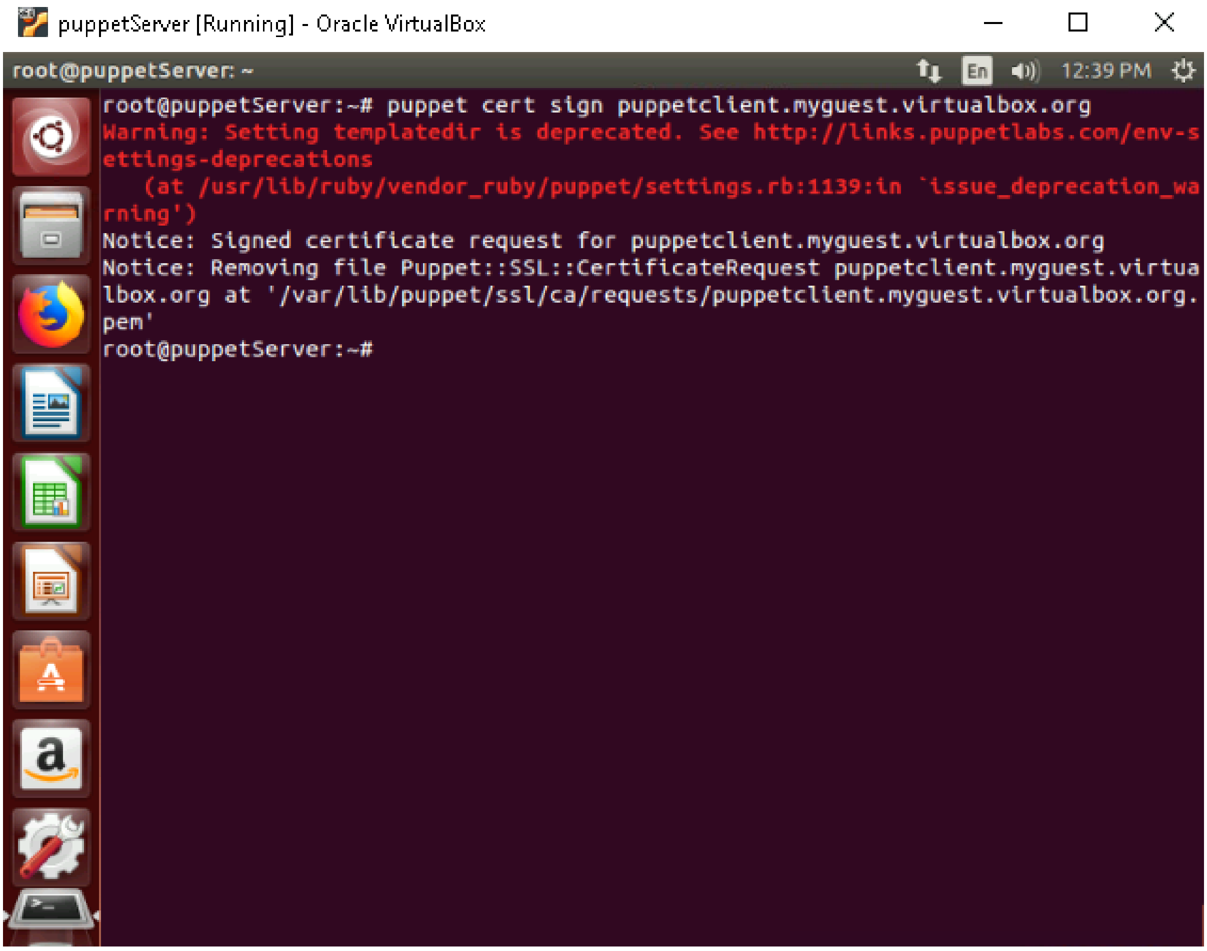
   ```
   puppet cert list
   ```



```
root@puppetServer:~# puppet cert list
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
  "puppetclient.myguest.virtualbox.org" (SHA256) 55:B4:0E:7C:3F:F4:AE:6E:FE:F4:EA:72:7A:B3:A7:17:D7:54:A5:07:FD:EA:13:93:D9:5D:A5:48:90:45:E8:7B
root@puppetServer:~#
```

Sign the certificate requested by the Puppet Agent:

```
puppet cert sign puppetclient.myguest.vrtualbox.org
```



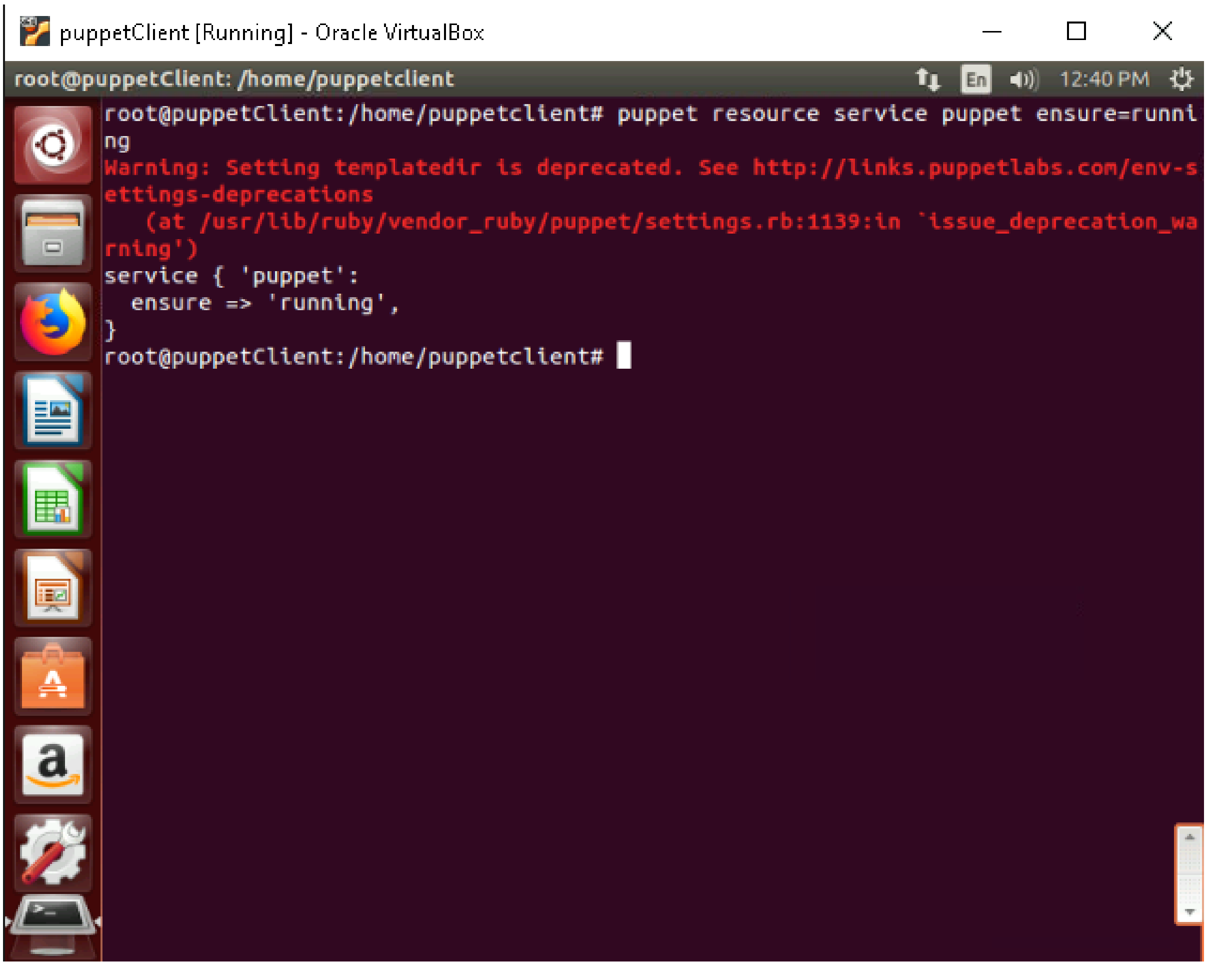
```
root@puppetServer:~# puppet cert sign puppetclient.myguest.virtualbox.org
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
Notice: Signed certificate request for puppetclient.myguest.virtualbox.org
Notice: Removing file Puppet::SSL::CertificateRequest puppetclient.myguest.virtualbox.org at '/var/lib/puppet/ssl/ca/requests/puppetclient.myguest.virtualbox.org.pem'
root@puppetServer:~#
```

> *Purpose:* Approves the certificate request from the Puppet Agent, establishing trust.

5. **Start and Enable Puppet Agent Service**:

   On `puppetClient`, start the Puppet Agent service:

   ```
   puppet resource service puppet ensure=running
   ```

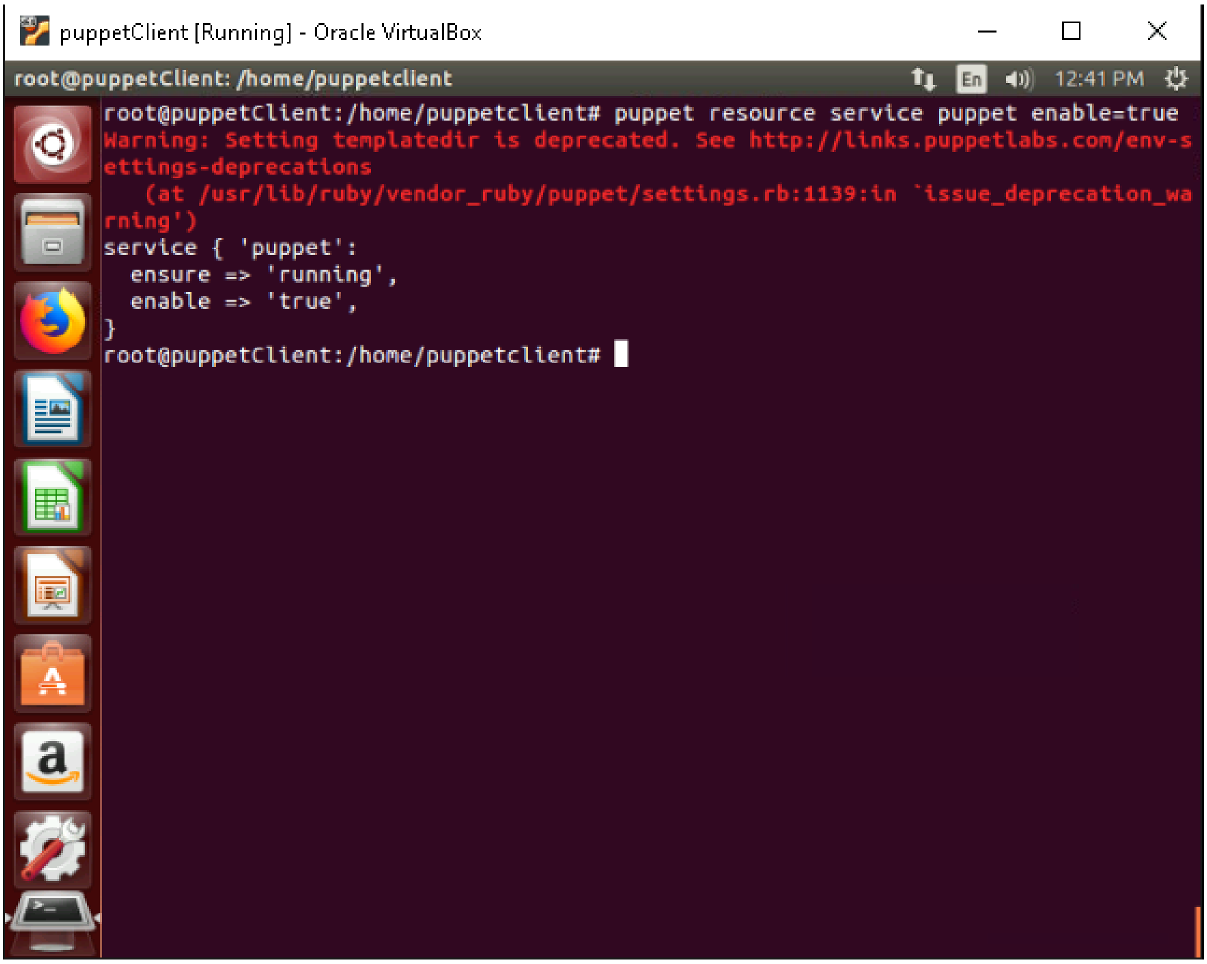


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
En
12:40 PM

```
root@puppetClient:/home/puppetclient# puppet resource service puppet ensure=running
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
service { 'puppet':
  ensure => 'running',
}
root@puppetClient:/home/puppetclient#
```

Enable the Puppet Agent service to start on boot:

```
puppet resource service puppet enable=true
```



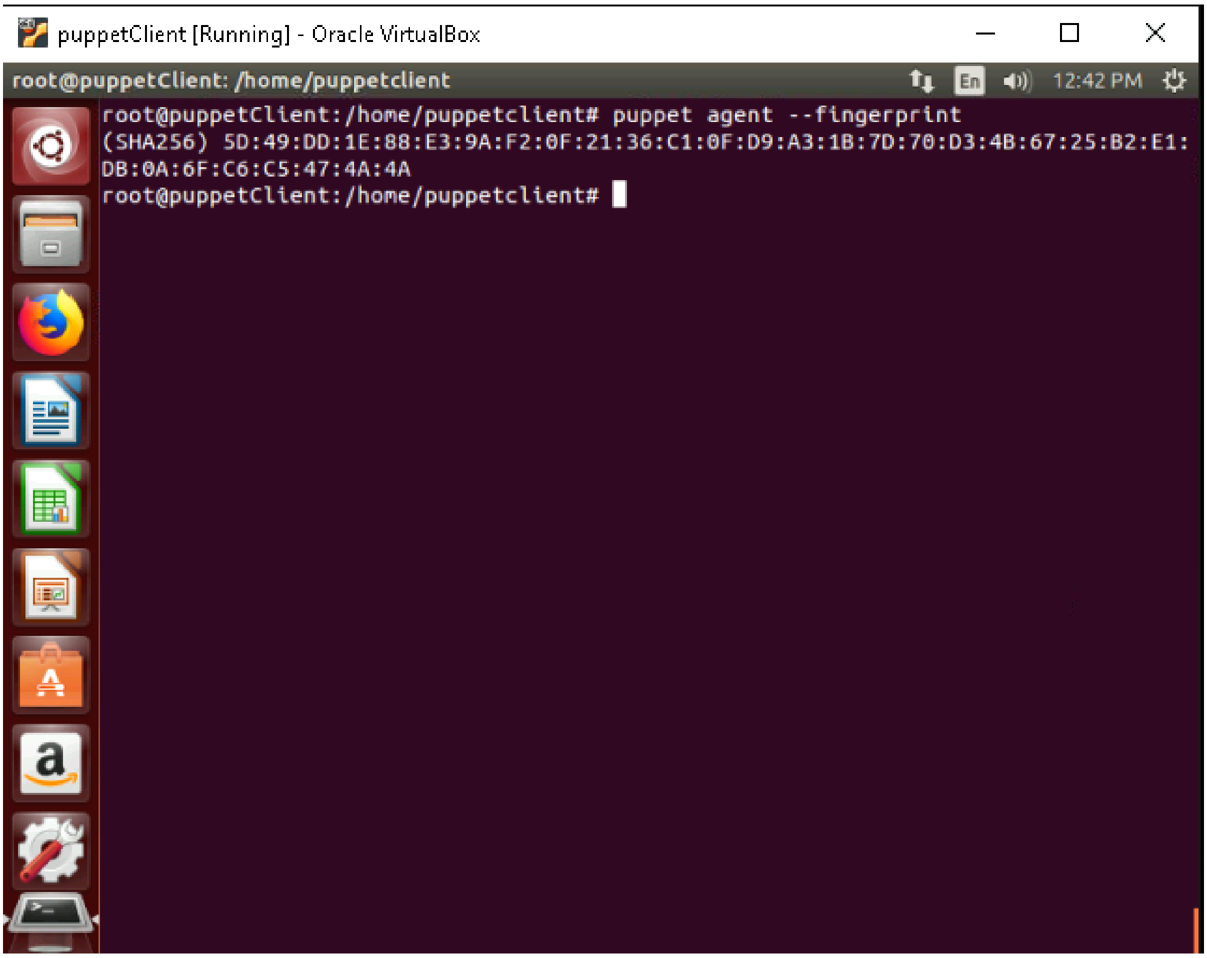
puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
En
12:41 PM

```
root@puppetClient:/home/puppetclient# puppet resource service puppet enable=true
Warning: Setting templatedir is deprecated. See http://links.puppetlabs.com/env-settings-deprecations
   (at /usr/lib/ruby/vendor_ruby/puppet/settings.rb:1139:in `issue_deprecation_warning')
service { 'puppet':
  ensure => 'running',
  enable => 'true',
}
root@puppetClient:/home/puppetclient#
```

6. **Verify Certificate Fingerprint**:

   On `puppetClient`, verify the fingerprint of the certificate:

   ```
   puppet agent --fingerprint
   ```


puppetClient [Running] - Oracle VirtualBox
root@puppetClient: /home/puppetclient
En
12:42 PM

```
root@puppetClient:/home/puppetclient# puppet agent --fingerprint
(SHA256) 5D:49:DD:1E:88:E3:9A:F2:0F:21:36:C1:0F:D9:A3:1B:7D:70:D3:4B:67:25:B2:E1:
DB:0A:6F:C6:C5:47:4A:4A
root@puppetClient:/home/puppetclient#
```

> *Purpose:* Confirms that the Puppet Agent has a valid certificate signed by the Puppet Master.

Now, there is a secure connection between the Puppet Master and the Puppet Agent.

References

- Puppet Installation Guide
- Oracle VirtualBox
- Ubuntu Trusty Tahr 14.04
