Practical No. 3

Aim: Configure NTP Server (NTPd), Install and Configure NTPd, Configure NTP Client (Ubuntu and Windows)

Description:

1. NTP
2. Ntp Server
3. Ntp Client

Steps:

If you need to keep the system time on your Linux computer accurate, NTP is the solution. Network Time Protocol is a suite of applications that allows computers to coordinate their system time.

Testing Environments

1. Installing and configuring NTP server on Ubuntu 16.04 server.
2. Installing NTP client on Ubuntu 16.04 client machine and ensure that it is synched by the Server.

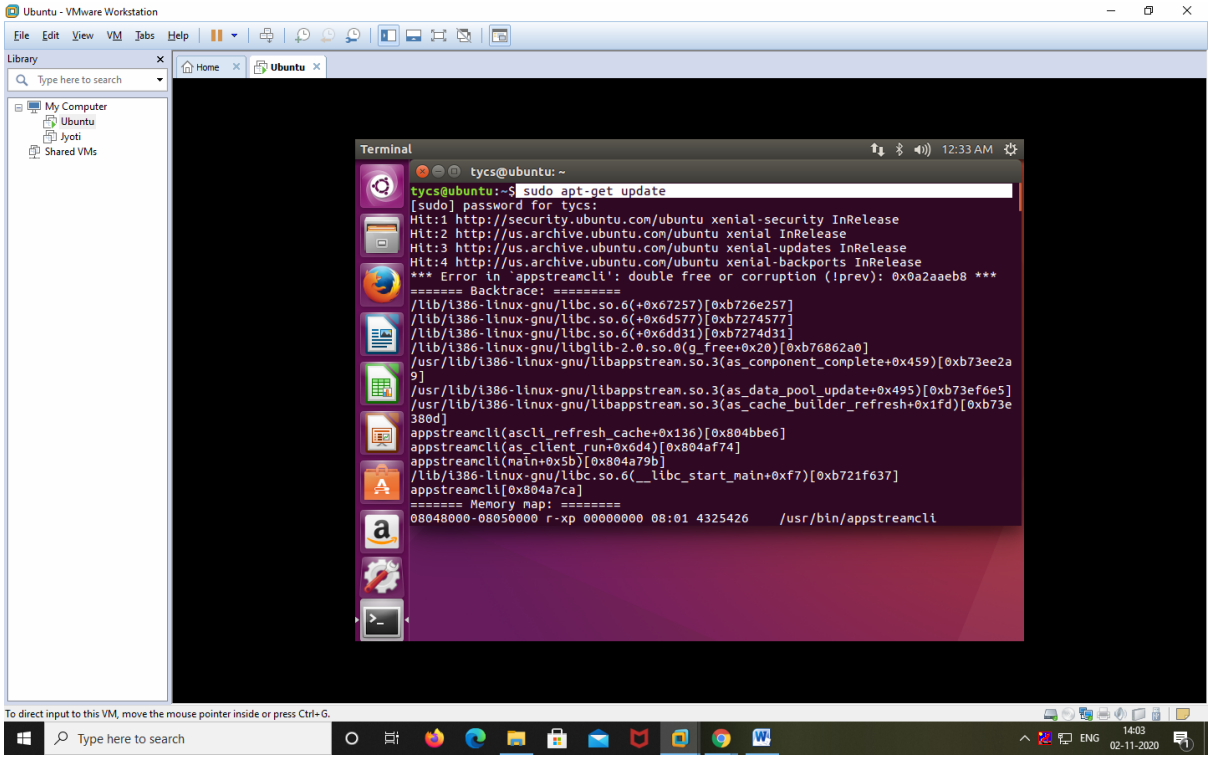
Install & Configure NTP Server on Ubuntu 16.04 Server

Installing the NTP server and making the necessary modifications to achieve the desired time synchronization in the network.

Step 1: Update System Repositories

To start off, let's begin by updating the system packages as shown.

$ sudo apt update -y

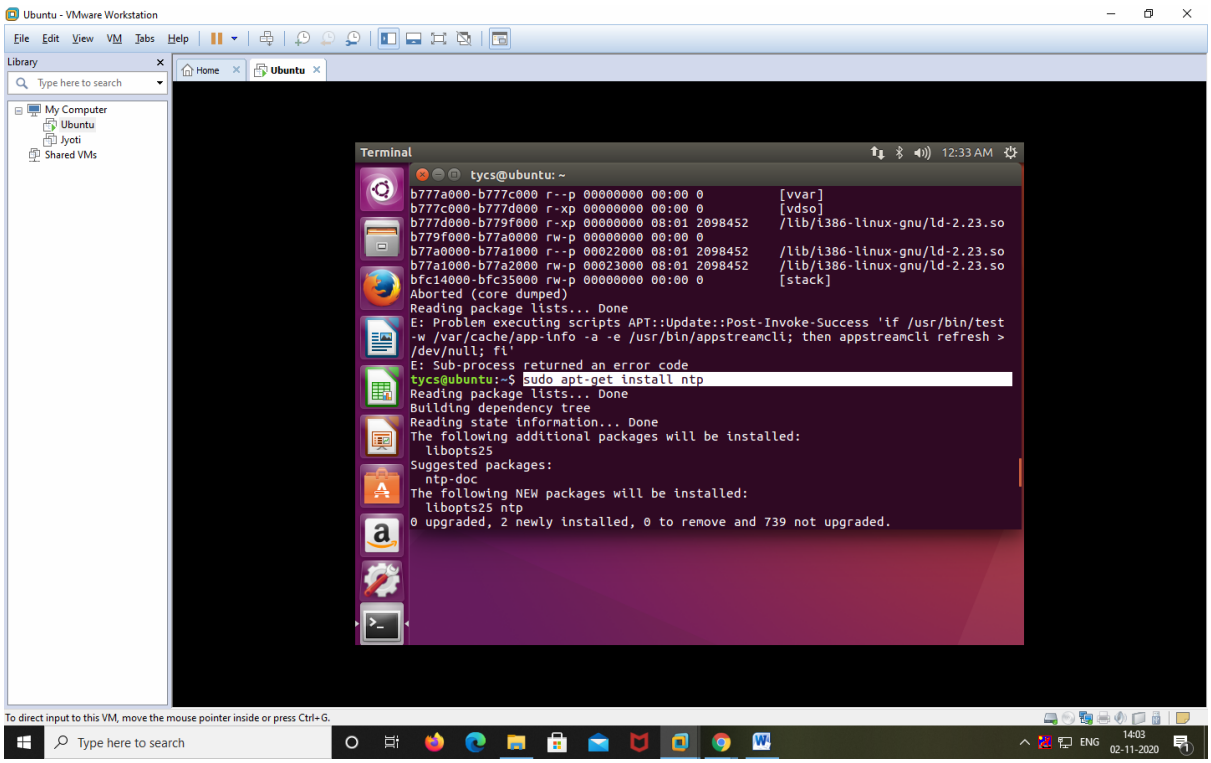


Step 2: Install NTP Server on Ubuntu 16.04

With system packages already installed, install NTP protocol on Ubuntu 16.04 LTS by running.

$ sudo apt install ntp

When prompted, type Y and hit ENTER to complete the installation process.



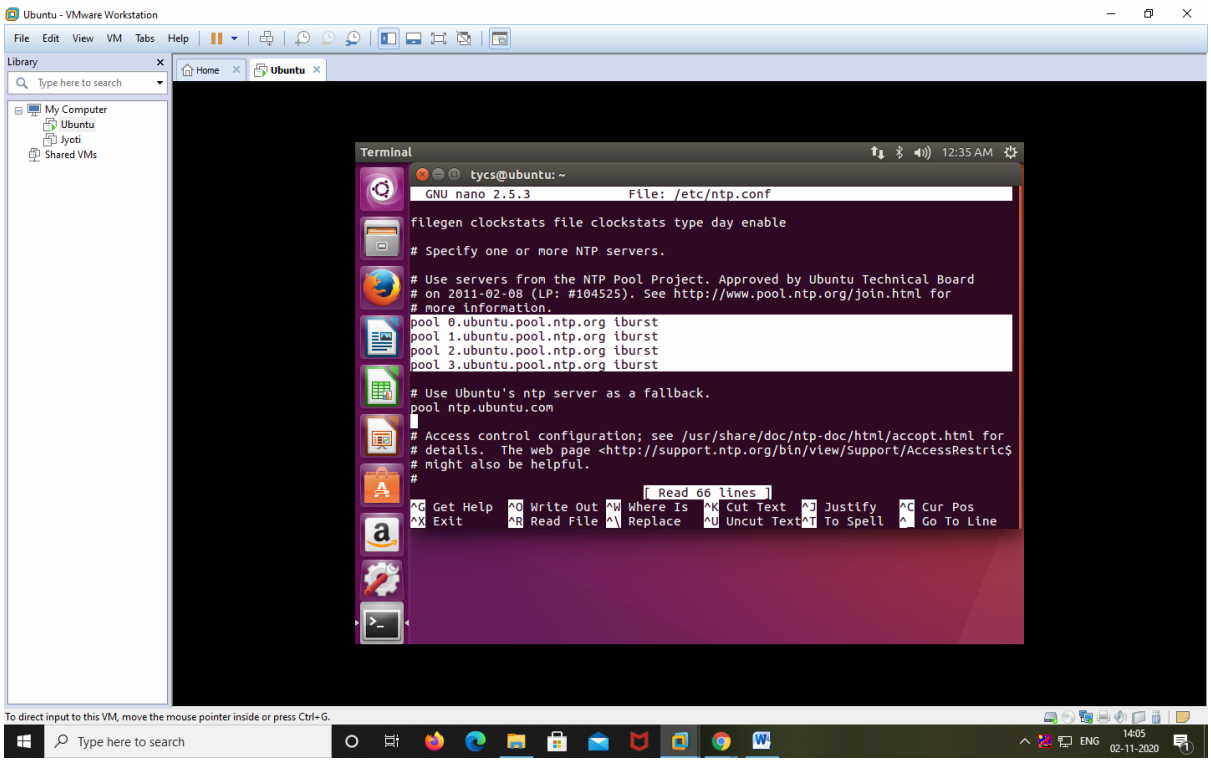
To confirm that NTP protocol has been successfully installed, run the command.

$ sntp –version

Step 3: Configure NTP Server Pools on Ubuntu 16.04

By default, NTP protocol comes with default NTP pool servers already configured in its configuration file as shown below in the /etc/ntp.conf file.

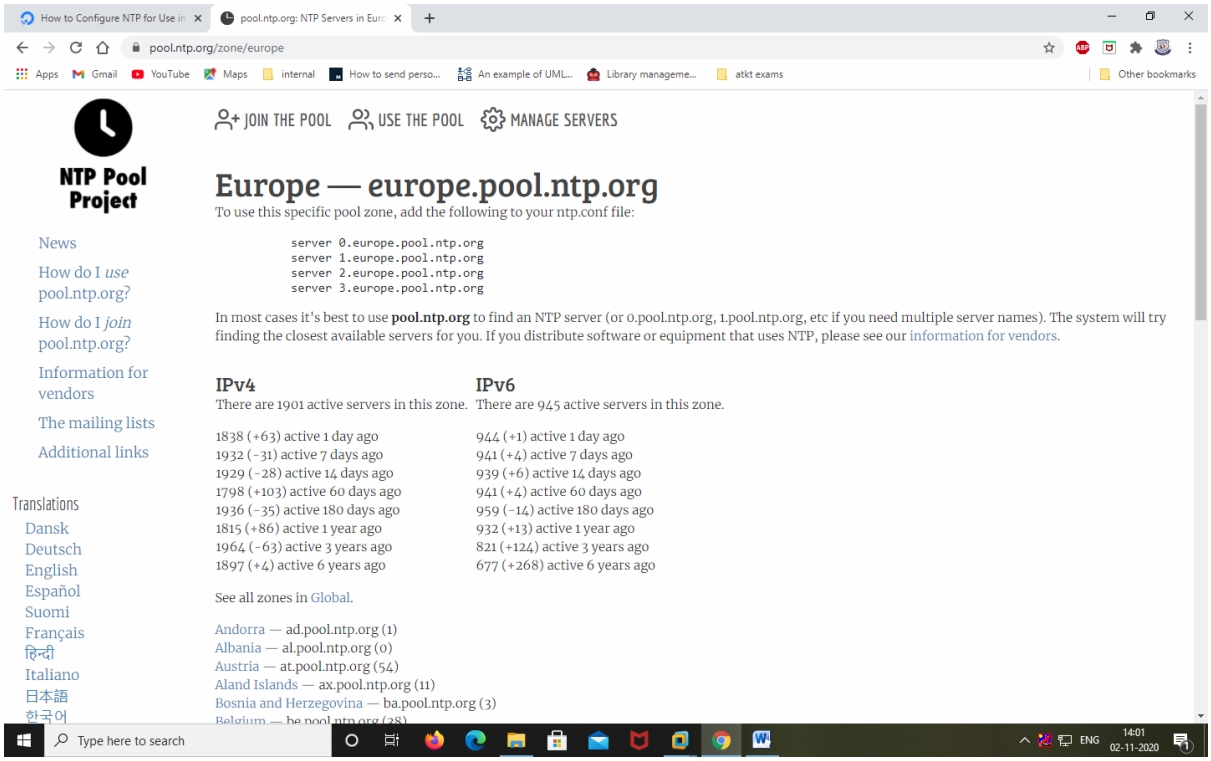
$sudo nano /etc/ntp.conf



These usually work just as fine. However, you may consider changing to NTP server pools closest to your location. The link below directs you to a page where you can select your most preferred NTP pool list.

https://support.ntp.org/bin/view/Servers/NTPPoolServers

In our example, we will use the NTP pools located in Europe as shown.



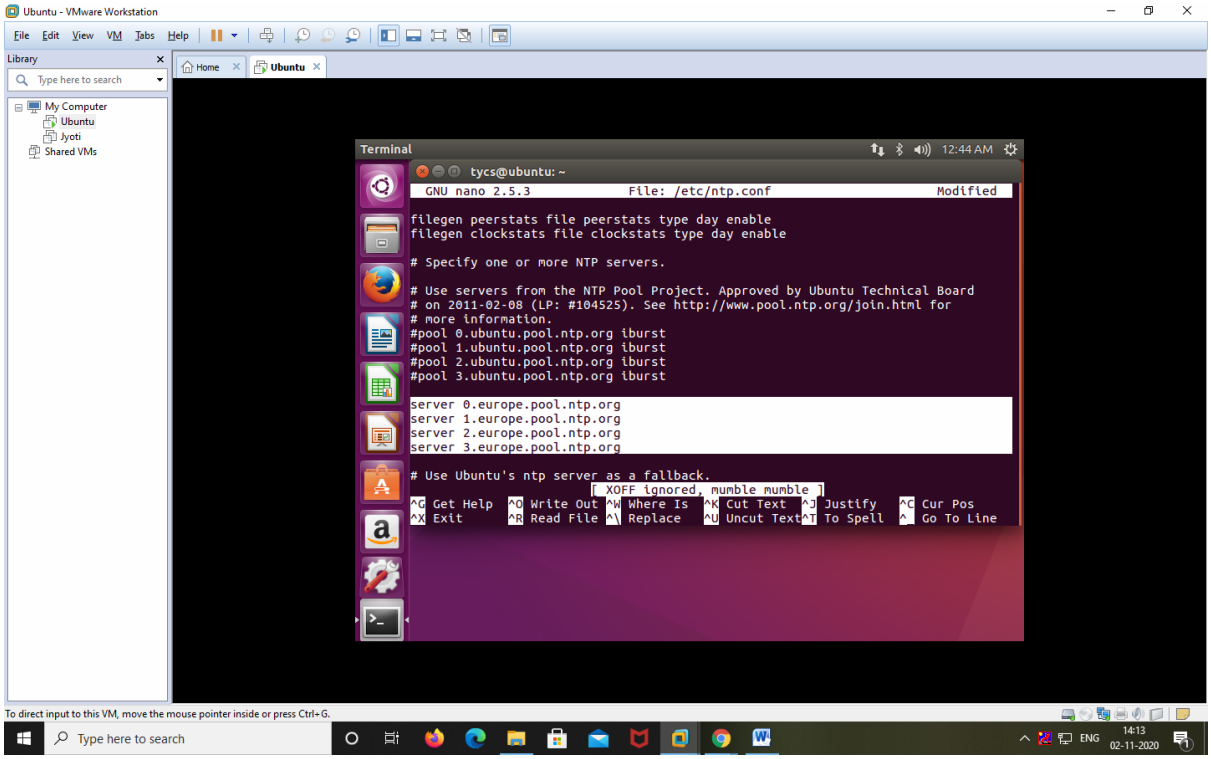
To replace the default NTP pool servers, open the NTP configuration file using your favorite text editor as shown.

$ sudo vim /etc/ntp.conf

Copy and paste the NTP pool list in Europe to the configuration files as shown.

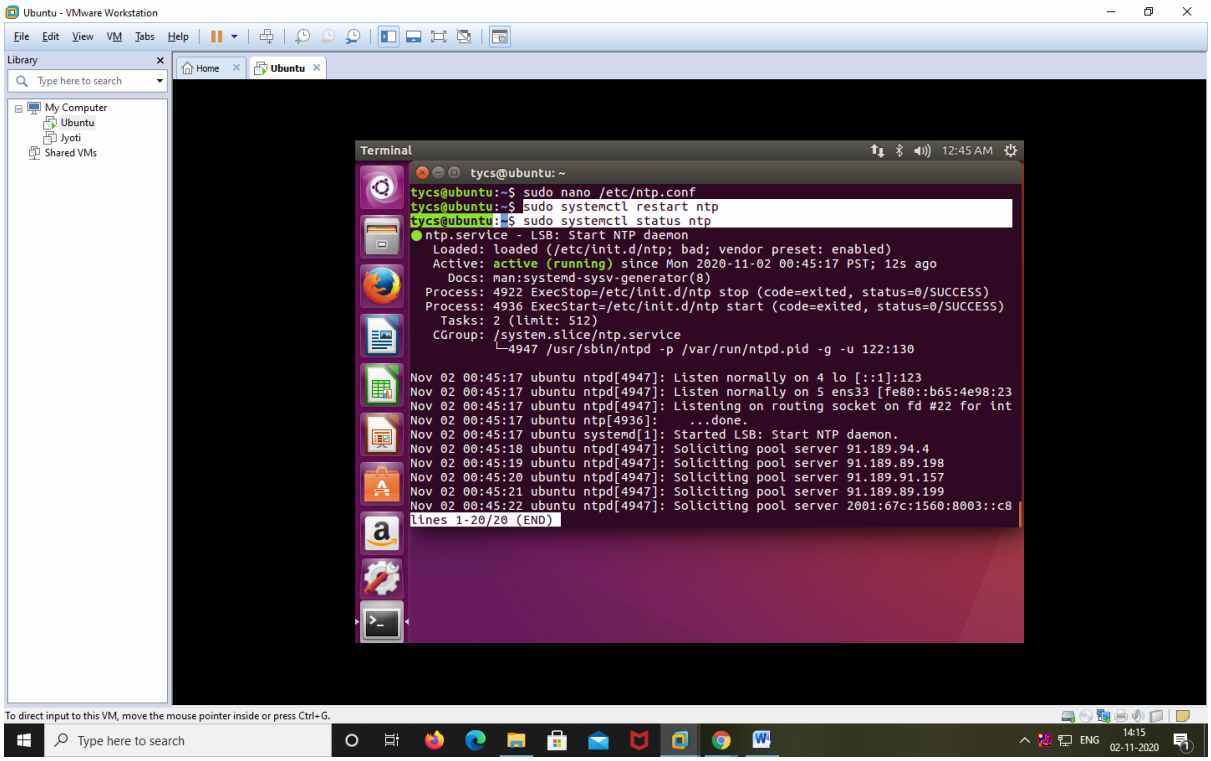
server 0.europe.pool.ntp.org
server 1.europe.pool.ntp.org
server 2.europe.pool.ntp.org
server 3.europe.pool.ntp.org

Next, save and quit the text editor.



For the changes to take effect, restart the NTP service and verify its status using the commands.

$ sudo systemctl restart ntp
$ sudo systemctl status ntp



If UFW firewall [(Uncomplicated Firewall), is a most popular and easy-to-use command line tool for configuring and managing a firewall on Ubuntu and Debian

distributions.] is enabled, we need to allow NTP service across it so that client machines can access the NTP server.

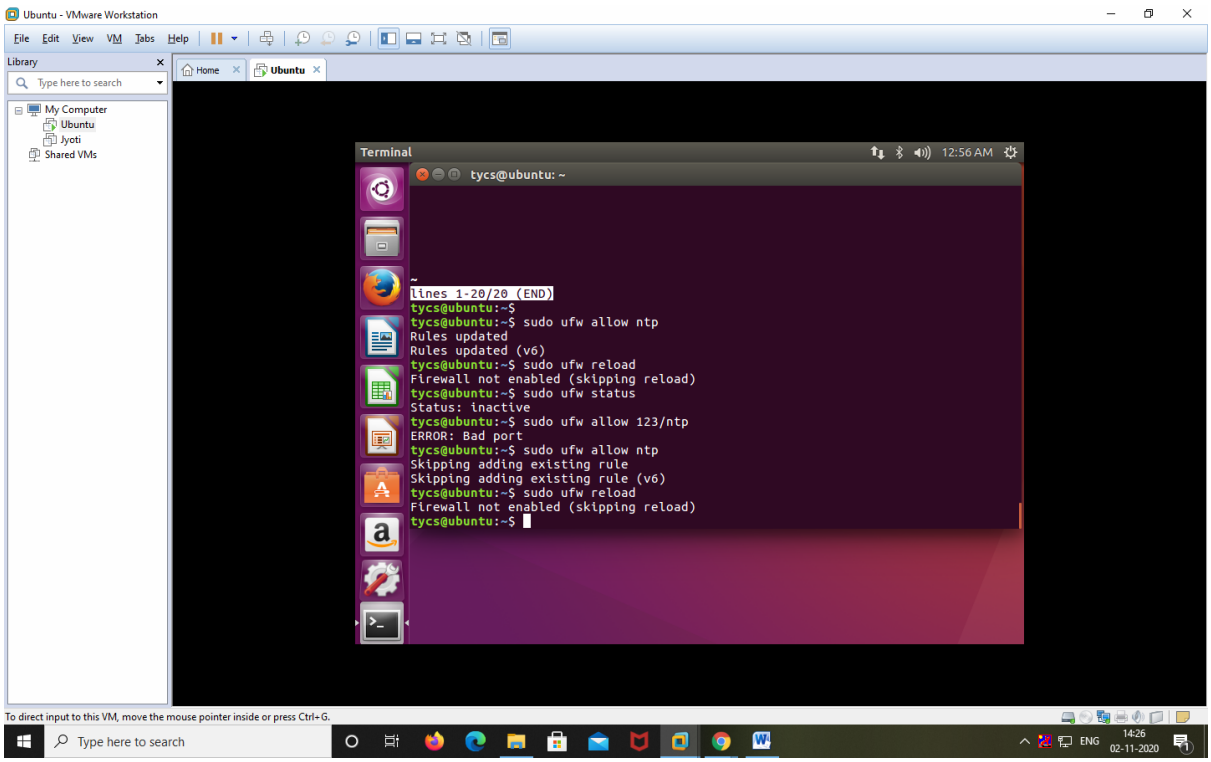
$ sudo ufw allow ntp

OR

$ sudo ufw allow 123/udp

To implement the changes, reload the firewall as shown: $ sudo ufw reload

To verify the changes made execute the command: $ sudo ufw status



Perfect! we have successfully set up our NTP server on Ubuntu 16.04 LTS system.

Let's now set up NTP on the client system.

Install & Configure NTP Client on Ubuntu 16.04 Client

In this section, we shall install and configure a NTP client on Ubuntu 16.04 client system to be synchronized by the Ubuntu 16.04 NTP Server system.

Step 1: Update System Repositories

To start off, update the system by running: $ sudo apt update -y

Step 2: Install Ntpdate on Ubuntu 16.04

ntpdate is a utility/program that quickly allows a system to synchronize time and date by querying an NTP server.

To install ntpdate run the command: $ sudo apt install ntpdate

For the client system to resolve the NTP server by hostname, you need to add the NTP server's IP address and hostname in the /etc/hosts file.

Therefore, Open the file using your favorite text editor : $ sudo vim /etc/hosts

Append the IP address and hostname as shown.

10.128.0.21[Server Ip Address] cs[Hostname]

Step 3: Verify Client Time Sync with NTP Server

To manually check if the client system is in sync with the NTP server's time, run the command.

$ sudo ntpdate NTP-server-hostname

In our case, the command will be.

$ sudo ntpdate cs

A time offset between the NTP server and the client system will be displayed as shown.

To synchronize the client time with the NTP server, you need to turn off the timesynchd service on the client system.

$ sudo timedatectl set-ntp off

Step 4: Install NTP Client on Ubuntu 18.04

Next, you need to install NTP service on the client system. To achieve this, issue the command.

$ sudo apt install ntp

Press Y when prompted and hit ENTER to proceed with the installation process.

Install NTP Client on Ubuntu

Install NTP Client on Ubuntu

Step 5: Configure NTP Client on Ubuntu 18.04

The objective in this step is to use the NTP server earlier configured to act as our NTP server. For this to happen we need to edit the /etc/ntp.conf file.

$ sudo vim /etc/ntp.conf

Append the line below where bionic is the NTP server's hostname.

server bionic prefer iburst

Configure NTP Client on Ubuntu

Configure NTP Client on Ubuntu

Save and exit the configuration file.

For the changes to come into effect, restart the NTP service as shown.

$ sudo systemctl restart ntp

Step 6: Verify the NTP Time Synchronization Queue

With the client and NTP server insync, you can view the sync details by executing the command.

$ ntpq -p

Sample Output

remote	refid	st	t	when	poll	reach	delay	offset	jitter

```
==============================================================================
 bionic          71.79.79.71      2 u    6   64  377    0.625   -0.252   0.063
```

This brings us to the end of this guide. At this point you have successfully configured the NTP server on Ubuntu 18.04 LTS and configured a client system to be synchronized with the NTP server. Feel free to reach out to us with your feedback.