

How to install NTP server and client on Ubuntu 24.04

NTP, or Network Time Protocol, is a protocol used to synchronize all system clocks in a network to use the same time.

NTP, or Network Time Protocol, is a protocol used to synchronize all system clocks on a network to use the same time. When using the term NTP, the article refers to the protocol itself and the client and server programs running on the computers connected to the network. NTP belongs to the traditional TCP/IP protocol suite and can easily be classified as one of its oldest components.

When you initially set up your clock to synchronize with NTP, it takes 6 exchanges over 5 to 10 minutes before the clock is set. Once the network clock is synchronized, the client updates its clock with the server every 10 minutes. This is typically done through a single message exchange (transaction). These transactions use system port 123.

This article will describe a step-by-step process on how to:

1. Install and configure NTP server on Ubuntu machine.
2. Configure NTP client to synchronize time with server.

The article ran the mentioned commands and procedures on Ubuntu 22.04 LTS and Ubuntu 24.04 systems.

Install and configure NTP server on host computer

Follow these steps to install NTP server on Ubuntu server:

Note : The article is using the Ubuntu command line, Terminal, to install and configure NTP. You can open the Terminal application via searching for the application launcher or the shortcut **Ctrl + Alt + T** .

Step 1: Update the package repository index

To install the latest software versions from the Internet repository, your local repository index must match them. Run the following command as sudo to update your local repository index:

```
$ sudo apt update
```

```
root@server1:/home/administrator# apt update
Hit:1 http://de.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://de.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://de.archive.ubuntu.com/ubuntu jammy-backports InRelease [107 kB]
Get:4 http://de.archive.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://de.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [941 kB]
Get:6 http://de.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [203 kB]
Get:7 http://de.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [679 kB]
Get:8 http://de.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [106 kB]
Get:9 http://de.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [879 kB]
Get:10 http://de.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [173 kB]
Get:11 http://de.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [9652 B]
Get:12 http://de.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [3260 B]
Get:13 http://de.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [40.7 kB]
Get:14 http://de.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [9800 B]
Get:15 http://de.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [19.5 kB]
Get:16 http://de.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [14.0 kB]
Get:17 http://de.archive.ubuntu.com/ubuntu jammy-security/main amd64 Packages [682 kB]
Get:18 http://de.archive.ubuntu.com/ubuntu jammy-security/main Translation-en [139 kB]
Get:19 http://de.archive.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [637 kB]
Get:20 http://de.archive.ubuntu.com/ubuntu jammy-security/restricted Translation-en [99.7 kB]
Get:21 http://de.archive.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [696 kB]
Get:22 http://de.archive.ubuntu.com/ubuntu jammy-security/universe Translation-en [111 kB]
Get:23 http://de.archive.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [4960 B]
Get:24 http://de.archive.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [996 B]
Fetched 5785 kB in 2s (3051 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
140 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

Step 2: Install NTP Server using apt-get

Please run the following command as sudo to install the NTP server daemon from the APT repository:

```
$ sudo apt install ntp
```

Please note that only authorized users can add, remove, and configure software on Ubuntu.

```
administrator@server1:~$ sudo apt install ntp
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libevent-core-2.1-7 libevent-pthreads-2.1-7 libopts25 sntp
Suggested packages:
  ntp-doc
The following packages will be REMOVED:
  systemd-timesyncd
The following NEW packages will be installed:
  libevent-core-2.1-7 libevent-pthreads-2.1-7 libopts25 ntp sntp
0 upgraded, 5 newly installed, 1 to remove and 2 not upgraded.
Need to get 949 kB of archives.
After this operation, 2558 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://de.archive.ubuntu.com/ubuntu jammy/main amd64 libevent-core-2.1-7 amd64 2.1.12-stable-1build3 [93.9 kB]
Get:2 http://de.archive.ubuntu.com/ubuntu jammy/main amd64 libevent-pthreads-2.1-7 amd64 2.1.12-stable-1build3 [7642 B]
Get:3 http://de.archive.ubuntu.com/ubuntu jammy/universe amd64 libopts25 amd64 1:5.18.16-4 [59.5 kB]
Get:4 http://de.archive.ubuntu.com/ubuntu jammy/universe amd64 ntp amd64 1:4.2.8p15+dfsg-lubuntu2 [721 kB]
Get:5 http://de.archive.ubuntu.com/ubuntu jammy/universe amd64 sntp amd64 1:4.2.8p15+dfsg-lubuntu2 [67.1 kB]
Fetched 949 kB in 0s (3056 kB/s)
```

The system may ask you for your sudo password and give you the Y/n option to continue the installation. Type **Y** and press **Enter** ; the NTP server will then be installed on your system. However, this process may take some time, depending on your Internet speed.

Step 3: Verify settings (optional)

You can verify your NTP settings and also check the version number by running the following command in Terminal:

```
$ sntp --version
```

```
administrator@server1:~$ sntp --version
sntp 4.2.8pi581.3728-o Wed Feb 16 17:13:02 UTC 2022 (1)
administrator@server1:~$
```

Step 4: Switch to the NTP server pool closest to your location

When you install an NTP server, it is usually configured to get the appropriate time. However, you can switch to the server pool closest to your location. This involves making some changes to the `/etc/ntp.conf` file.

Open the file in nano editor as sudo by running the following command:

```
$ sudo nano /etc/ntp.conf
```

```
GNU nano 6.2
# /etc/ntp.conf, configuration for ntpd; see ntp.conf(5) for help

driftfile /var/lib/ntp/ntp.drift

# Leap seconds definition provided by tzdata
 leapfile /usr/share/zoneinfo/leap-seconds.list

# Enable this if you want statistics to be logged.
#statsdir /var/log/ntpstats/

statistics loopstats peerstats clockstats
filegen loopstats file loopstats type day enable
filegen peerstats file peerstats type day enable
filegen clockstats file clockstats type day enable

# Specify one or more NTP servers.

# Use servers from the NTP Pool Project. Approved by Ubuntu Technical Board
# on 2011-02-08 (LP: #104525). See http://www.pool.ntp.org/join.html for
# more information.
pool 0.ubuntu.pool.ntp.org iburst
pool 1.ubuntu.pool.ntp.org iburst
pool 2.ubuntu.pool.ntp.org iburst
pool 3.ubuntu.pool.ntp.org iburst

# Use Ubuntu's ntp server as a fallback.
pool ntp.ubuntu.com
```

In this file, you will be able to see the pool list. The task here is to replace this pool list with the pool of the time server closest to your location. The `pool.ntp.org` project provides reliable NTP service from a cluster of time servers. To select the pool list according to your location, visit the following page:

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

https://www.pool.ntp.org/zone/us

JOIN THE POOL USE THE POOL MANAGE SERVERS

United States — us.pool.ntp.org

To use this specific pool zone, add the following to your ntp.conf file:

```
server 0.us.pool.ntp.org
server 1.us.pool.ntp.org
server 2.us.pool.ntp.org
server 3.us.pool.ntp.org
```

In most cases it's best to use **pool.ntp.org** to find an NTP server (or 0.pool.ntp.org, 1.pool system will try finding the closest available servers for you. If you distribute software or information for vendors.

IPv4	IPv6
There are 514 active servers in this zone.	There are 222 active servers in this zone.
502 (+12) active 1 day ago	225 (-3) active 1 day ago
521 (-7) active 7 days ago	222 (-1) active 7 days ago

This page asks us to add the following lines to the ntp.conf file:

```
server 0.us.pool.ntp.org server 1.us.pool.ntp.org server 2.us.pool.ntp.org server
```

This is the file interface after adding the above lines:

```
GNU nano 6.2
# /etc/ntp.conf, configuration for ntpd; see ntp.conf(5) for help

driftfile /var/lib/ntp/ntp.drift

# Leap seconds definition provided by tzdata
leapfile /usr/share/zoneinfo/leap-seconds.list

# Enable this if you want statistics to be logged.
#statsdir /var/log/ntpstats/

statistics loopstats peerstats clockstats
filegen loopstats file loopstats type day enable
filegen peerstats file peerstats type day enable
filegen clockstats file clockstats type day enable

# Specify one or more NTP servers.

# Use servers from the NTP Pool Project. Approved by Ubuntu Technical Board
# on 2011-02-08 (LP: #104525). See http://www.pool.ntp.org/join.html for
# more information.
pool 0.ubuntu.pool.ntp.org iburst
pool 1.ubuntu.pool.ntp.org iburst
pool 2.ubuntu.pool.ntp.org iburst
pool 3.ubuntu.pool.ntp.org iburst

# Use Ubuntu's ntp server as a fallback.
pool ntp.ubuntu.com
```

Exit the file by pressing **Ctrl + X** and enter **y** to save changes.

Step 5: Restart NTP server

For the above changes to take effect, you need to restart the NTP server. Run the following command as sudo to do so:

```
$ sudo service ntp restart
```

Step 6: Verify that the NTP server is running

Now, check the status of NTP service using the following command:

```
$ sudo service ntp status
```

```
administrator@server1:~$ sudo service ntp status
● ntp.service - Network Time Service
   Loaded: loaded (/lib/systemd/system/ntp.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2023-03-07 11:54:35 UTC; 5s ago
     Docs: man:ntpd(8)
   Process: 42935 ExecStart=/usr/lib/ntp/ntp-systemd-wrapper (code=exited, status=0/SUCCESS)
  Main PID: 42942 (ntpd)
    Tasks: 2 (limit: 4538)
   Memory: 1.3M
      CPU: 32ms
   CGroup: /system.slice/ntp.service
           └─42942 /usr/sbin/ntpd -p /var/run/ntpd.pid -g -u 108:112

Mar 07 11:54:35 server1 ntpd[42942]: Listen normally on 6 ens33 [fe80::20c:29ff:fe3f:ae4d%2]:123
Mar 07 11:54:35 server1 ntpd[42942]: Listening on routing socket on fd #23 for interface updates
Mar 07 11:54:35 server1 ntpd[42942]: kernel reports TIME ERROR: 0x2041: Clock Unsynchronized
Mar 07 11:54:35 server1 ntpd[42942]: kernel reports TIME ERROR: 0x2041: Clock Unsynchronized
Mar 07 11:54:35 server1 systemd[1]: Started Network Time Service.
Mar 07 11:54:36 server1 ntpd[42942]: Soliciting pool server 2620:2d:4000:1::3f
Mar 07 11:54:37 server1 ntpd[42942]: Soliciting pool server 2620:2d:4000:1::40
Mar 07 11:54:38 server1 ntpd[42942]: Soliciting pool server 2620:2d:4000:1::41
Mar 07 11:54:39 server1 ntpd[42942]: Soliciting pool server 185.125.190.57
Mar 07 11:54:40 server1 ntpd[42942]: Soliciting pool server 91.189.94.4
administrator@server1:~$
```

The Active status verifies that the NTP server is active.

Step 7: Configure the firewall so that the client can access the NTP server

Finally, it's time to configure the system's UFW firewall so that incoming connections can access the NTP server at UDP port number 123.

Run the following command as sudo to open port 123 for incoming traffic:

```
$ sudo ufw allow from any to any port 123 proto udp
```

```
administrator@server1:~$ sudo ufw allow from any to any port 123 proto udp
Rules updated
Rules updated (v6)
administrator@server1:~$
```

Your Ubuntu server is now configured as an NTP server.

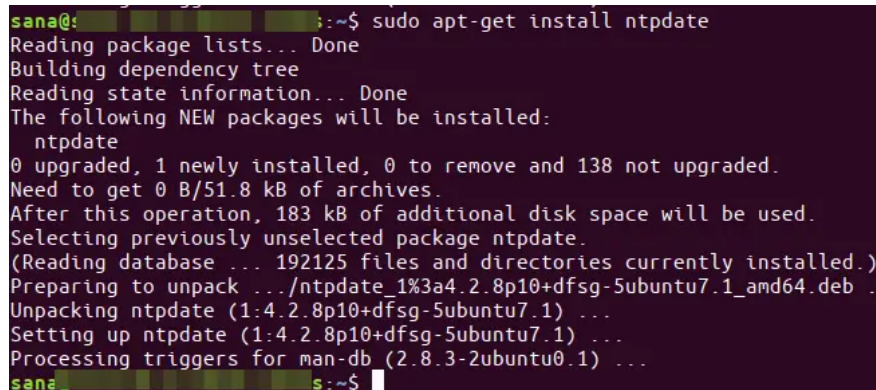
Configure NTP client to synchronize time with NTP server

Now, let's configure the Ubuntu client to synchronize time with the NTP server.

Step 1: Install ntpdate

The ntpdate command will allow you to manually test your connection configuration with the NTP server. Open the Terminal application on the client and enter the following command as sudo:

```
$ sudo apt-get install ntpdate
```

A terminal window showing the command 'sudo apt-get install ntpdate' and its output. The output indicates that the package ntpdate is being installed, with details about disk space and file operations.

```
sana@:~$ sudo apt-get install ntpdate
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
 ntpdate
0 upgraded, 1 newly installed, 0 to remove and 138 not upgraded.
Need to get 0 B/51.8 kB of archives.
After this operation, 183 kB of additional disk space will be used.
Selecting previously unselected package ntpdate.
(Reading database ... 192125 files and directories currently installed.)
Preparing to unpack .../ntpdate_1%3a4.2.8p10+dfsg-5ubuntu7.1_amd64.deb
Unpacking ntpdate (1:4.2.8p10+dfsg-5ubuntu7.1) ...
Setting up ntpdate (1:4.2.8p10+dfsg-5ubuntu7.1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
sana@:~$
```

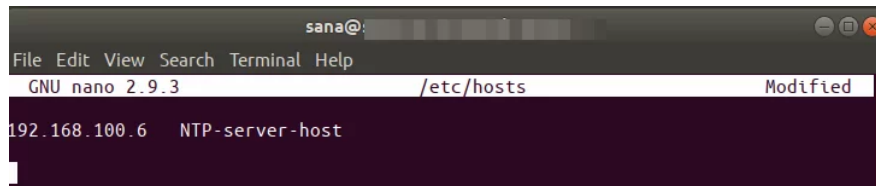
Step 2: Specify the IP and hostname of the NTP server in the hosts file

In order for your NTP server to resolve to the hostname in the client, you need to configure your /etc/hosts file.

Open the hosts file as sudo in the nano editor by entering the following command:

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

Now, add the IP of the NTP server and specify the hostname as follows in this file:

A terminal window showing the nano editor editing the /etc/hosts file. The file content is '192.168.100.6 NTP-server-host'.

```
sana@
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hosts Modified
192.168.100.6 NTP-server-host
```

Exit the file by pressing **Ctrl + X** and then save by typing **y** .

Step 3: Check if the client's time is synchronized with the NTP server

The following ntpdate command will allow you to manually check if the time is synchronized between the client and server systems:

```
$ sudo ntpdate NTP-server-host
```

The ideal output would be to display the time difference between the two systems.

Step 4: Disable the systemd timesyncd service on the client

Since we want the client to synchronize time with the NTP server, let's disable the timesyncd service on the client.

Enter the following command to execute:

```
sana@:~$ sudo timedatectl set-ntp off  
sana@:~$
```

Step 5: Install NTP on client

Run the following command as sudo to install NTP on the client:

```
$ sudo apt-get install ntp
```

Step 6: Configure the /etc/ntp.conf file to add the NTP server as a new time server

Now, we want our client to use our own NTP host server as the default time server. To do this, we need to edit the /etc/ntp.conf file on the client.

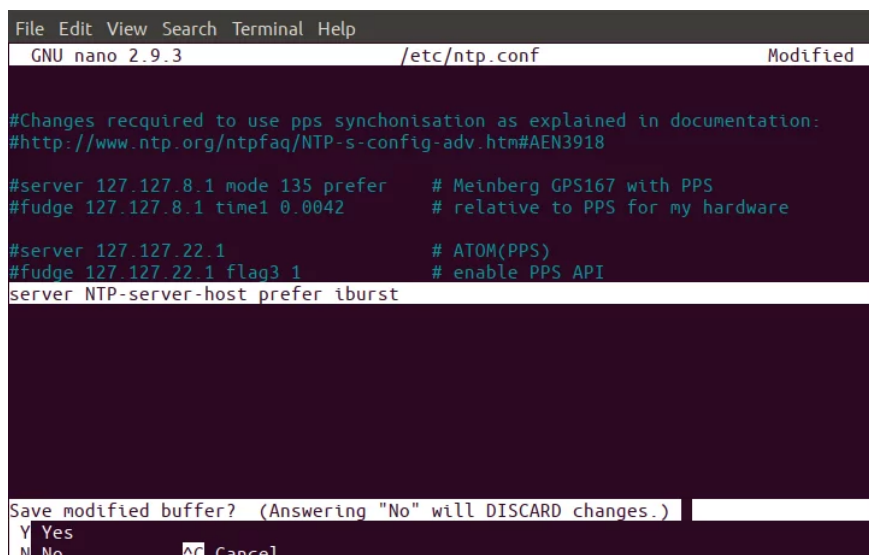
Run the following command as sudo to open the file in the Nano editor:

```
$ sudo nano /etc/ntp.conf
```

Then add the following line to the file, where NTP-server-host is the hostname you specified for your NTP server:

```
server NTP-server-host prefer iburst
```

This is what the file looks like after specifying the time server:



```
File Edit View Search Terminal Help  
GNU nano 2.9.3 /etc/ntp.conf Modified  
  
#Changes required to use pps synchronisation as explained in documentation:  
#http://www.ntp.org/ntpfaq/NTP-s-config-adv.htm#AEN3918  
  
#server 127.127.8.1 mode 135 prefer # Meinberg GPS167 with PPS  
#fudge 127.127.8.1 time1 0.0042 # relative to PPS for my hardware  
  
#server 127.127.22.1 # ATOM(PPS)  
#fudge 127.127.22.1 flag3 1 # enable PPS API  
server NTP-server-host prefer iburst  
  
Save modified buffer? (Answering "No" will DISCARD changes.)  
Y Yes  
N No [Ctrl] Cancel
```

Press **Ctrl + X** to close the file and type **y** to save changes.

Step 7: Restart NTP server

For the above changes to take effect, you need to restart the NTP service. Run the following command as sudo to do so:

```
$ sudo service ntp restart
```

Step 8: View the time sync queue

Now your client and server are configured to synchronize time. You can view the time synchronization queue by running the following command:

```
$ ntpq -ps
```

You should be able to see NTP-server-host as the time synchronization host/source in the queue.

So that's all you need to know about installing and configuring NTP to synchronize the time on your networked Ubuntu machines. The process may seem a bit complicated, but if you follow all the steps carefully, your machines will be synchronized in no time.

You finished reading the article "**How to install NTP server and client on Ubuntu 24.04**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.