**Network Time Protocol (NTP)**

**Network Time Protocol** (NTP) is a protocol that helps the computers clock times to be synchronized in a network. This protocol is an application protocol that is responsible for the synchronization of hosts on a TCP/IP network. NTP was developed by David Mills in 1981 at the University of Delaware. This is required in a communication mechanism so that a seamless connection is present between the computers.

**Features of NTP :**   
Some features of NTP are –

* NTP servers have access to highly precise atomic clocks and GPU clocks
* It uses Coordinated Universal Time (UTC) to synchronize CPU clock time.
* Avoids even having a fraction of vulnerabilities in information exchange communication.
* Provides consistent timekeeping for file servers

**How to Install and Use Chrony in Linux?**

chrony is a flexible Network Time Protocol implementation (NTP). It can sync the system clock with NTP servers, reference clocks (such as a GPS receiver), and manual input via wristwatch and keyboard. It can also act as an NTPv4 (RFC 5905) server and peer, allowing other computers on the network to receive timely updates.

A local server must use an NTP client to get the correct time from a remote NTP server. One such customer is Chrony. Chrony is an excellent option for this reason because it is designed to operate in a variety of situations, including unreliable and/or highly congested network connections, as well as other adverse conditions. At boot time, Chrony synchronizes the computer’s internal clock with higher Stratum NTP servers, a reference clock, or the computer’s real-time clock. Using a wristwatch and a keyboard, it can also be manually synchronized with the input. This is not the most reliable form of synchronization, and it is strongly discouraged.

On a LAN, the precision between two synchronized machines is usually within a few milliseconds. Chrony is divided into two systems: chronyc and chronyd.

* Chronyc is a command-line interface for monitoring and tweaking chronyd’s output.
* Chronyd is a background-running daemon that starts and activates the chrony NTP service and tracks the time and status of the time-server.

The chrony.conf file specifies the time NTP server that chronyd tracks. The primary feature of the Chronyd system is to obtain accurate time from one of the major NTP server sources. If the server time is off, chronyd will adjust the device clock to compensate.

**Chrony includes two programs:**

* **chronyd**— daemon that can be started at boot time
* **chronyc** — command-line interface for chrony

How to Install Chrony in Linux:

Chrony may be installed by default on certain devices. And if the kit is missing, it is simple to install. Using the command below, use your default package manager utility on your respective Linux distributions.

# yum -y install chrony [On CentOS/RHEL]

# apt install chrony [On Debian/Ubuntu]

# dnf -y install chrony [On Fedora 22+]



*installing chrony*

**To check the status of chronyd use the following command:**

# systemctl status chronyd [On SystemD]

# /etc/init.d/chronyd status [On Init]

**Enable chrony daemon upon boot with the** **following command:**

* **Residual freq —** residual frequency indicated the difference between the measurements from the reference source and the frequency currently being used.
* **Skew —** estimated error bound of the frequency.
* **Root delay —**Total of the network path delays to the stratum computer, from which the computer is being synced.
* **Leap status —**this is the leap status that can have one of the following values – normal, insert second, delete second, or not synchronized.

# systemctl enable chronyd [On SystemD]

# chkconfig --add chronyd [On Init]

To Check Chrony Synchronization in Linux:

We’ll use chrony’s command-line software, chronyc, to see whether it’s actually synchronized. It has a monitoring feature that will provide useful details.

# chronyc tracking

