

# Setting up NTP for NMM

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NMM can be used for locally running multimedia applications and for networked multimedia applications. For running networked multimedia applications, properly synchronized clocks of all participating systems are often required, e.g. if you want to achieve lip-synchronous audio and video rendering on different distributed systems. We are using NTP, the network time protocol, for establishing a global time within the network. This document describes how to set up NTP for NMM. We only discuss a simple setup, for further information, please see the official NTP documentation.

## 1. Introduction

When synchronizing the clocks of two systems, one system acts as the server, the other as client. The clock of the client is synchronized to the clock of the server. Optionally, the server can be configured to be synchronized to an NTP server in the Internet. Additional clients can be added easily by performing the same steps as for the first client.

## 2. NTP Packages for different Operating Systems

First, you need to install the NTP packages provided for your operating system.

### 2.1. Linux

For GNU/Linux, you will find a suitable installation package for your distribution easily. Sometimes, there are separate packages for the NTP server and client. The configuration of NTP is done by modifying the file `/etc/ntp.conf` (and, depending on your distribution, also `/etc/sysconfig/xntp` or `/etc/sysconfig/ntp`) as described below.

### 2.2. MacOS

For MacOS, NTP is already installed and running. The configuration of NTP is done by modifying the file `/etc/ntp.conf` as described below.

### 2.3. Windows

For Windows, we recommend to use the Meinberg NTP distribution (<http://www.meinberg.de/english/sw/ntp.htm>). Please refer to the installation instructions (<http://www.meinberg.de/english/sw/readme-ntpinstaller.htm>) provided by Meinberg. The configuration of NTP can be done during installation. We recommend to replace the created file called `ntp.conf` (e.g. in `C:\Program Files\NTP\etc`) as described below.

## 3. Configuration of the NTP Server

For the NTP server, you typically do not need to change the configuration. If at all, you might want to add an IP (or hostname) of an NTP server in the Internet in order to keep your system time synchronized to

the rest of the world.

..

```
server <IP address of NTP server in the Internet>
```

..

For more information, please refer to the official NTP documentation.

## 4. Restarting the NTP service

After changes of the NTP configuration, the NTP service needs to be restarted. This needs to be done for NTP server or client. Depending on your operating system, the easiest way to do this is to reboot your system.

### 4.1. Linux

On Linux, restarting the NTP service can be done as root with following command.

```
/etc/init.d/ntp restart
```

or

```
/etc/init.d/xntpd restart
```

For stopping the NTP service, use 'stop' instead of 'restart'. For starting the NTP service, use 'start' instead of 'restart'.

### 4.2. MacOS

On MacOS, stopping the NTP service can be done with following command.

```
sudo killall -9 ntpd
```

Starting the NTP service can be done with following command:

```
sudo ntpd
```

## 4.3. Windows

Stopping the NTP service is done by terminating the process with name 'ntpd.exe' in the Windows task manager. Starting, however, can then only be done by directly calling 'ntpd' in the command line of a terminal.

## 5. Configuration of NTP Clients

For the NTP client, the configuration should be changed as follows.

```
..  
  
server XXX.XXX.XXX.XXX burst prefer minpoll 4 maxpoll 4  
server 127.127.1.0  
fudge 127.127.1.0 stratum 10  
  
..
```

We recommend to keep this order of entries and to remove all other lines starting with 'server'.

Instead of XXX.XXX.XXX.XXX, use the IP of your local NTP server. Restart the NTP service as described above. Then, you have to wait until the clocks of both hosts are synchronized. This can take some time. You can check this by using 'ntpq -p') on the NTP client. The offset printed out is given in milliseconds and should be less than 10 milliseconds. Offsets of 1 millisecond or less can be achieved easily using NTP. If not, please read further documentation on NTP or check the log files generated by NTP.

For speeding up the initial synchronization of clocks, you can use 'ntpdate'. First, stop the NTP service. Then run following sequence of commands:

```
ntpdate -b XXX.XXX.XXX.XXX  
ntpdate -b XXX.XXX.XXX.XXX  
ntpdate -b XXX.XXX.XXX.XXX
```

Again, XXX.XXX.XXX.XXX should be replaced by the IP address of your local NTP server. After these three commands, the clock of the client should be synchronized below 10 milliseconds to your NTP server. Then, you need to restart the NTP service on the client.