CentOS / Red Hat Configure an NTP Client And Server

last updated June 24, 2010 **in CentOS, Fedora Linux, Hardware, Iptables, Linux, Networking, Package Management, RedHat and Friends**

How do I configure an NTP (Network Time Protocol) client or server under CentOS / RHEL / Fedora Linux to manage the system clock over a network?

The Network Time Protocol (NTP) is used to synchronize a computer's time with another reference time source. Under CentOS / RHEL you can use NTP or OpenNTPD server software. Both package provides client and server software programs for time synchronization.

Install ntp

The ntp package contains utilities and daemons that will synchronize your computer's time to Coordinated Universal Time (UTC) via the NTP protocol and NTP servers. The ntp packageincludes ntpdate (a program for retrieving the date and time from remote machines via a network) and ntpd (a daemon which continuously adjusts system time). Install the ntp package:

```
# yum install ntp
```

How do I configure an NTP Client?

Simply open /etc/ntp.conf file, enter:

```
# vi /etc/ntp.conf
```

Make sure the following line exists:

```
server ntp.server.com
```

Where,

- **ntp.server.com** : the hostname or IP address of the site NTP server. If your ntp server located at 192.168.1.5, enter **server 192.168.1.5**. You can also use public ntp server located at ntp.org.

You can also run ntpd using cron:

```
# echo '30 * * * * root /usr/sbin/ntpd -q -u ntp:ntp' > /etc/cron.d/ntpd
```

The above instructs crond to run ntpd and after setting the clock just exit, and the -u option instructs it to run as the ntp user.

Configure an NTP Server

If you have lots of server and desktop system, configure your own NTP server. Your NTP server contacts a central NTP server,provided by your ISP or a public time server located at ntp.org, to obtain accurate time data. The server then allows other machines on your network to request the time data. Our sample setup:

```
192.168.1.5            ==> CentOS / Fedora / RHEL NTPD Server.
202.54.1.5              ==> ISP remote NTP server.
192.168.1.0/24        ==> NTP clients including desktop systems.
```

First, install and enable ntpd on 192.168.1.5:

```
# yum install ntp
# chkconfig ntpd on
```

Now open /etc/ntp.conf:

```
# vi /etc/ntp.conf
```

Make sure the following line exits:

```
restrict default ignore
```

Above will deny all access to any machine, server or client. However, you need to specifically authorized policy settings. Set it as follows:

```
restrict 202.54.1.5 mask 255.255.255.245 nomodify notrap noquery
server 202.54.1.5
```

Replace 202.54.1.5 and mask with actual remote ISP or ntp.org NTP server IP. Save and close the file.

Configure NTP clients to access your NTP Server

Now, you need to allow legitimate NTP clients to access the Server. For example, allow 192.168.1.0/24 network to synchronize to this server located at 192.168.1.5. Open /etc/ntp.conf and add policy as follows:

```
# Hosts on local network are less restricted.
restrict 192.168.1.0 mask 255.255.255.0 nomodify notrap
```

Update your firewall settings, open /etc/sysconfig/iptables.

```
# vi /etc/sysconfig/iptables
```

Add the following line, before the final LOG and DROP lines for the RH-Firewall-1-INPUT chain:

```
-A RH-Firewall-1-INPUT -s 192.168.1.0/24 -m state --state NEW -p udp --dport 123 -j ACCEPT
```

Save and close the file. Finally, start ntpd:

```
# service ntpd start
# service iptables restart
# netstat -tulpn
```

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The author is the creator of nixCraft and a seasoned sysadmin, DevOps engineer, and a trainer for the Linux operating system/Unix shell scripting. Get the **latest tutorials on SysAdmin, Linux/Unix and open source topics via RSS/XML feed** or weekly email newsletter.

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24 comment

Tapas Mallick March 18, 2009 at 10:46 am

Nice tutorial. Could you please discuss about secure NTP based on “Key Based” security. Regards, Tapas.

KHIZAR May 27, 2009 at 7:49 am

Good tutorial, but discuss ntp in more detail thank you
regards Khizar Saeed Khan

Eduardo Costa July 23, 2009 at 8:31 pm

Excellent post! This is the smallest tutorial I ever found about NTP... Very easy to follow! Solved a lot of doubts I had about configuring the client... Thanks a lot!

Miguel Verdugo October 29, 2009 at 3:46 pm

Very good tutorial. Thanks.

Mario November 24, 2009 at 12:24 pm

Although you can set the time by running ntp in a cron job, this is seriously not recommended for anything but a simple home setup.

For anything setup for work-related services, rather set the time through the NTP service. This will skew the time in a safer way than making a big time change in case the time has gone completely out since the last cron run.

razor April 13, 2010 at 5:09 pm

Great tutorial.. saved me lots of time. Thanks

rmedster June 30, 2010 at 1:21 pm

How to make ntp-client to send a time-request from a particular interface?

kaliram sahu July 14, 2010 at 12:31 pm

i have faced a error an ntp server configuration. your system is not reach syncronize time. but some time autometic reach server.
how to reach ntp properly,. i am user server ntpd restart , ntpq -indp ,and ntpdate command but not solve my problem.
please solve this problem.

Nir January 7, 2011 at 9:47 pm

Excellent tutorial as always.

thank you.

temuri June 24, 2011 at 1:35 pm

HI I have NTP server, and wants to send data with rs232 to windows 2000 workstation
can someone help me ?

thanks

LCAlvarez June 24, 2011 at 6:09 pm

Excellent, thanks a lot from Panama, PTY 507

Excelente, muchas gracias desde PanamÃ¡
LCAlvarez.

Samuel September 12, 2011 at 12:16 pm

Unable to synchronise meinberg NTP time server to clients

Below is the NTP configuration file

NTP Network Time Protocol
**** ATTENTION ****: *You have to restart the NTP service when you change this file to activate the changes*
PLEASE CHECK THIS FILE CAREFULLY AND MODIFY IT IF REQUIRED
Configuration File created by Windows Binary Distribution Installer Rev.: 1.26 mbg
please check http://www.ntp.org for additional documentation and background information
Use drift file
#driftfile “C:\Program Files\NTP\etc\ntp.drift”
#multicastclient
#broadcastdelay 0.008

your local system clock, should be used as a backup
(this is only useful if you need to distribute time no matter how good or bad it is)
server 127.127.1.1
but it operates at a high stratum level to let the clients know and force them to
use any other timesource they may have.
fudge 127.127.1.1 stratum 12

#driftfile /etc/ntp.drift
driftfile “C:\Program Files\NTP\etc\ntp.drift”
multicastclient
broadcastdelay 0.008

broadcastclient yes

```
# Use a NTP server from the ntp pool project (see http://www.pool.ntp.org)

server ntp.a-lab.fi iburst

# allow localhost
restrict 127.0.0.1

# Please note that you need at least four different servers to be at least protected against

server 192.168.3.189 iburst
#accept packets from
restrict 192.168.3.100 mask 255.255.255.0 nomodify notrap
restrict 192.168.3.101 mask 255.255.255.0 nomodify notrap

# one falseticker. If you only rely on internet time, it is highly recommended to add
# additional servers here.
# The ‘iburst’ keyword speeds up initial synchronization, please check the documentation for more details!
server 0.fi.pool.ntp.org minipoll 10 iburst
server 1.fi.pool.ntp.org minpoll 10 iburst
#server 2.fi.pool.ntp.org iburst
#server 1.se.pool.ntp.org iburst
#server 0.de.pool.ntp.org iburst

# End of generated ntp.conf — Please edit this to suite your needs

###################################################################
#Section insert by NTP Time Server Monitor 30.8.2011

enable stats
statsdir “C:\Program Files\NTP\etc\”
statistics loopstats
###################################################################
```

And also the NTP status is shown below

```
State Remote Refid Stratum Type When Poll Reach Delay Offset Jitter
LOCAL(1) LOCL 12 Local clock 51 64 003 0.000 0.000 0.001
* 212.213.168.140 130.149.17.8 2 Unicast server 50 64 003 16.149 4.178 0.482
```

192.168.3.189 INIT 16 Unicast server 1023d 64 000 0.000 0.000 0.000
+ 87.108.20.69 192.36.143.150 2 Unicast server 96 1024 001 6.086 -5.366 0.115

Kindly make the neccessary corrections for

Graham Lerant September 28, 2011 at 1:10 pm

Very nice walkthrough.
Especially the IPtables section.
It's usually easy to configure the server – quite another thing to achieve connectivity!
thanks!

Jason June 27, 2012 at 7:14 pm

Is it possible to allow multiple IP ranges in the IPtables? I tried multiple lines, but it had an error saying that is not allowed.

Andre July 2, 2012 at 6:13 pm

I have been looking on the net everywhere for a decent tutorial for setting up NTP to no avail.
I have a RHEL 6 host install. I created 2 RHEL 6 VMs with IP 192.168.1.10 & .11
I have been trying to get the .11 client to use the .10 as its NTP server. I have tried following dozens of instructions, but have always gotten " no server suitable for syncronization found.
Leaving the default data in each ntp.conf file...i have tried following several different instructions that basically have been saying the same thing as above...but still cant connect.
The machines can ping each other yet cannot connect for NTP. I have added the port 123 udp in the firewall to allow that to be open.

Can anyone provide assistance to anything that I may be ommiting. Can I try deleting/commenting all the default content and just insert statements suggested?

Thanks

Chandan October 12, 2012 at 10:07 pm

You are just amazing. You got every answer to our daily sysadmin work items. Thanks for all your posts.

Nikila March 21, 2013 at 9:07 am

hi,
I wanted to know how could I configure an NTP client using IPv6 address?
Currently my ntp version is
ntpd – NTP daemon program – Ver. 4.2.4p4

Jim April 17, 2013 at 6:53 am

One more question – you descibe how to configure an ntp client really well. But on a Linux system, how do you tell it to actually use ntp for its clock. Merely having the client running doesnt mean the system will use it.

Robert May 8, 2013 at 1:31 pm

L.s,

Good tutorial but how to test if ntp is working correctly?
yuo can test with:
ntpstat
ntpq -pn
ntpq -p

Also it is not clear in wich order the access rules must be placed.

> **Alex** January 15, 2017 at 1:40 pm
>
> Thank you so much!!!

Dinesh February 18, 2014 at 7:24 am

Please mentoined below step for standalone server.

If the server you are setting up do not have internet connection, you can synchronize it with the local time of the server itself. Just comment the server part, and change it to 127.127.1.0. The sratum level is for determining what level this time server is set up for. Stratum 0 usually refers to real

clock, for example atomic (cesium, rubidium) clocks or GPS clocks or other radio clocks. Stratum 1 is the machine connected to stratum 0 devices.

#server mst.sirim.my prefer
#server my.pool.ntp.org
server 127.127.1.0
fudge 127.127.1.0 stratum 10

flyerfan October 6, 2014 at 5:01 pm

Any help on using a GPS connection from the serial input tty0?

tks

James March 16, 2015 at 4:33 pm

Hi,

The mask should be 255.255.255.255.

Cheers,

James

Premnath Bangar February 4, 2016 at 4:33 pm

Dear Team,

Please let me know how to configure Replication of NTP Server.

Regards,
Premnath Bangar.

Have a question? Post it on our forum!

Tagged as: /etc/ntp.conf, /etc/sysconfig/iptables, accurate time, chkconfig, coordinated universal time, daemons, desktop system, desktop systems, iptables open port 123, network time protocol, ntp client, ntp network, ntp protocol, ntp servers, ntp tutorial, open port 123, open port tcp 123, protocol client, public ntp server, public time, restart ntpd, server ntp, start ntpd, system clock, time data, time server, time source, time utc