NTP and NFS Notes

Sunday, November 17, 2024 12:24 AM

Install Chrony in MACHINE A:
sudo yum install chrony -y

Edit the ***/etc/chrony.conf***:

allow 100.64.28.0/24
allow 10.21.32.0/24

server time-a-wwv.nist.gov iburst
server time-a-b.nist.gov iburst

And comment the following line:
#pool 2.rocky.pool.ntp.org iburst

```
[root@router ~]# cat /etc/chrony.conf
# Use public servers from the pool.ntp.org project.
# Please consider joining the pool (https://www.pool.ntp.org/join.html).
#pool 2.rocky.pool.ntp.org iburst

server time-a-wwv.nist.gov iburst
server time-a-b.nist.gov iburst

# Use NTP servers from DHCP.
sourcedir /run/chrony-dhcp

# Record the rate at which the system clock gains/losses time.
driftfile /var/lib/chrony/drift

# Allow the system clock to be stepped in the first three updates
# if its offset is larger than 1 second.
makestep 1.0 3

# Enable kernel synchronization of the real-time clock (RTC).
rtcsync

# Enable hardware timestamping on all interfaces that support it.
#hwtimestamp *

# Increase the minimum number of selectable sources required to adjust
# the system clock.
#minsources 2

# Allow NTP client access from local network.
allow 100.64.28.0/24
allow 10.21.32.0/24
```

Start and enable chronyd:
Systemctl enable chronyd
Systemctl start chronyd

Instal chrony in other machines
yum install -y chrony #for rocky

Enable systemd-timesyncd #for debian machines (C and F)

Install ntpd on BSD
in machine X ntpd is a part of Free BSD no need to install it

edit the etc/rc.conf file:

```
root@bsd:~ # cat /etc/rc.conf

ifconfig_vmx0="DHCP"
sshd_enable="YES"
moused_nondefault_enable="NO"
# Set dumpdev to "AUTO" to enable crash dumps, "NO" to disable
dumpdev="NO"
zfs_enable="YES"
ntpd_enable="YES"
```

Add the following command in ***/etc/ntp.conf:***
server 100.64.28.1 iburst

Comment the pool mentioned there:

```
# The option `iburst' is used for faster initial synchronization.
#
#pool 0.freebsd.pool.ntp.org iburst
#pool 2.freebsd.pool.ntp.org iburst
```

Start the ntpd serivice:
service ntpd start

Verify the ntpd status:
service ntpd status

Verify the synch with NTP server:
ntpq -p

```
root@bsd:~ # ntpq -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
*dmz.dundermiffl 132.163.97.1     2 u  221 1024  377    0.240   -0.195   0.222
root@bsd:~ # ntpq -n -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
*100.64.28.1     132.163.97.1     2 u  230 1024  377    0.240   -0.195   0.222
root@bsd:~ #
```

NFS configurations:

In machine E (NFS Server)
Install and configure NFS Server:
Yum install -y nfs-utils

Create and set permissions for /home/accounting/www:
sudo mkdir -p /home/accounting/www
sudo chmod 2770 /home/accounting/www

Add the following command /etc/exports:
/home/accounting/www 100.64.28.0/24(rw,sync,root_squash,no_all_squash)

Export the directory:
exportfs -r

Start and enable the NFS server:
systemctl enable --now nfs-server

On Machine C (NFS Client):
Install the NFS Client in machine C
dnf install -y nfs-utils

Create a mount point in machine C:
sudo mkdir -p /var/www/html/dundermifflin/accounting

After creating the mount point run the following command:
mount -o ro,soft 10.21.32.2:/home/accounting/www
/var/www/html/dundermifflin/accounting

Edit the /etc/fstab:

```
root@web0:~# cat /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# systemd generates mount units based on this file, see systemd.mount(5).
# Please run 'systemctl daemon-reload' after making changes here.
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=4fd4ad56-591d-4deb-87e6-178b946af906 /               ext4    errors=remount-ro 0       1
# swap was on /dev/sda5 during installation
UUID=42547dde-9c74-4b14-8ec4-5fbec352a5af none            swap    sw              0       0
/dev/sr0        /media/cdrom0   udf,iso9660 user,noauto     0       0


10.21.32.2:/home/accounting/www /var/www/html/dundermifflin/accounting nfs ro,soft 0 0
root@web0:~#
```

and restart by giving:
Systemctl daemon-reload

Set Up Automounter on Machine C:
install autofs in machine C
dnf install -y autofs

Edit ***/etc/auto.master***:

```
# Note that if there are entries for /net or /misc (as
# above) in the included master map any keys that are the
# same will not be seen as the first read key seen takes
# precedence.
#
+auto.master

/- /etc/auto.direct
root@web0:~#
```

Add the following command in ***/etc/auto.direct***:

```
root@web0:~# cat /etc/auto.direct
/var/www/html/dundermifflin/accounting -ro,soft 10.21.32.2:/home/accounting/www
root@web0:~#
```

Restart the automounter:
systemctl restart autofs

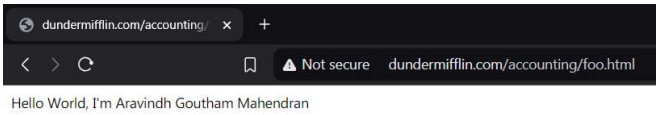
Do the same for Machine D

For testing
Create a file in machine E under ***/home/accounting/www*** using
Touch foo.html

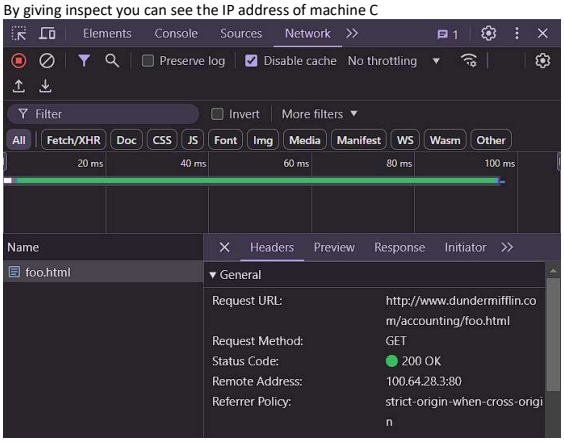
Use ***nano foo.html*** to edit the file

```
[root@nfs www]# ls
foo.html
[root@nfs www]# cat foo.html
Hello World, I'm Aravindh Goutham Mahendran
[root@nfs www]#
```

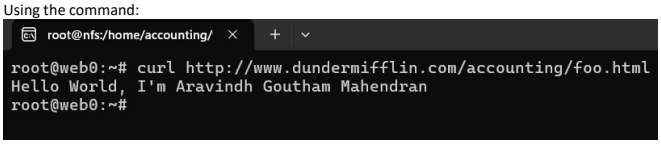
Verify it by browsing www.dundermifflin.com/accounting/foo.html



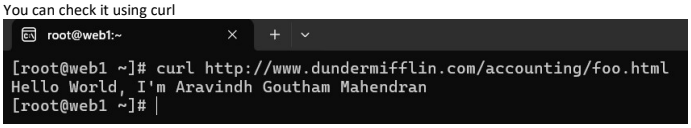
By giving inspect you can see the IP address of machine C



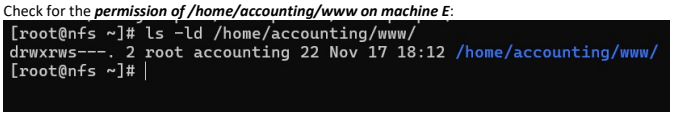
You can use curl on machine C
Using the command:



In machine D the back-up server:
You can check it using curl



Check for the ***permission of /home/accounting/www on machine E***:

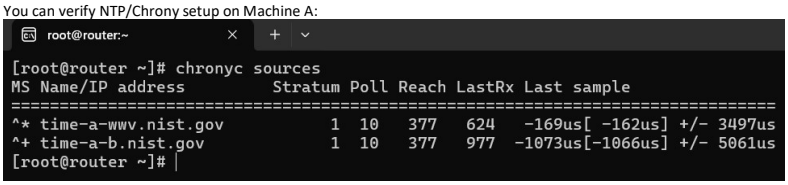


Edit the DHCP server in machine A:
/etc/dhcp/dfcpd.conf

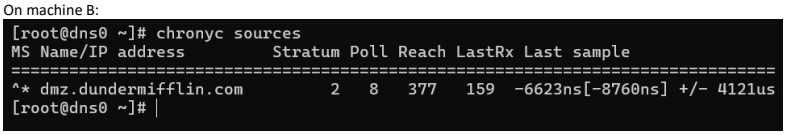
```
option domain-name "dundermifflin.com";
option domain-name-servers 100.64.28.2, 100.64.28.6;
option ntp-servers 100.64.28.1;
default-lease-time 600;
max-lease-time 600;
```

Add **option ntp-servers 100.64.28.1;**

You can verify NTP/Chrony setup on Machine A:



Test time sync on Machines B-F and X:
On machine B:



On machine C:

```
root@web0:~#  timedatectl show-timesync
SystemNTPServers=100.64.28.1
FallbackNTPServers=0.debian.pool.ntp.org 1.debian.pool.ntp.org 2.debian.pool.ntp.org 3.debian.pool.ntp.org
ServerName=100.64.28.1
ServerAddress=100.64.28.1
RootDistanceMaxUSec=5s
PollIntervalMinUSec=32s
PollIntervalMaxUSec=34min 8s
PollIntervalUSec=34min 8s
NTPMessage={ Leap=0, Version=4, Mode=4, Stratum=2, Precision=-26, RootDelay=5.691ms, RootDispersion=961us, Reference=84A36101, OriginateTimestamp=Mon 2024-11-18 01:09:49 MST, ReceiveTimestamp=Mon 2024-11-18 01:09:49 MST, TransmitTimestamp=Mon 2024-11-18 01:09:49 MST, DestinationTimestamp=Mon 2024-11-18 01:09:49 MST, Ignored=no, PacketCount=18, Jitter=112us }
Frequency=1590037
root@web0:~#
```

On machine D:

```
[root@web1 ~]# chronyc sources
MS Name/IP address         Stratum Poll Reach LastRx Last sample
===============================================================================
^* dmz.dundermifflin.com         2   8   377    91  +8899ns[  +17us] +/- 4249us
[root@web1 ~]#
```

On machine F:

```
root@dns1:~# timedatectl show-timesync
SystemNTPServers=100.64.28.1
FallbackNTPServers=0.debian.pool.ntp.org 1.debian.pool.ntp.org 2.debian.pool.ntp.org 3.debian.pool.ntp.org
ServerName=100.64.28.1
ServerAddress=100.64.28.1
RootDistanceMaxUSec=5s
PollIntervalMinUSec=32s
PollIntervalMaxUSec=34min 8s
PollIntervalUSec=34min 8s
NTPMessage={ Leap=0, Version=4, Mode=4, Stratum=2, Precision=-26, RootDelay=5.691ms, RootDispersion=1.449ms, Reference=84A36101, OriginateTimestamp=Mon 2024-11-18 01:17:54 MST, ReceiveTimestamp=Mon 2024-11-18 01:17:54 MST, TransmitTimestamp=Mon 2024-11-18 01:17:54 MST, DestinationTimestamp=Mon 2024-11-18 01:17:54 MST, Ignored=no, PacketCount=20, Jitter=246us }
Frequency=1911711
root@dns1:~#
```

On machine E:

```
[root@nfs ~]# chronyc sources
MS Name/IP address         Stratum Poll Reach LastRx Last sample
===============================================================================
^* dmz.dundermifflin.com         2  10   377   309    -16us[  -22us] +/- 4079us
[root@nfs ~]#
```

On machine X:

```
root@bsd:~ #  ntpq -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
*dmz.dundermiffl 132.163.97.1     2 u  975 1024  377    0.272   -0.272   0.175
root@bsd:~ #
```

Verify NFS Server on Machine E:

```
[root@nfs ~]# exportfs -v
/home/accounting/www
                100.64.28.0/24(sync,wdelay,hide,no_subtree_check,sec=sys,rw,secure,root_squash,no_all_squash)
[root@nfs ~]#
```

Test NFS access from Machine C:

```
root@web0:~# showmount -e 10.21.32.2
Export list for 10.21.32.2:
/home/accounting/www 100.64.28.0/24
root@web0:~# mount | grep /var/www/html/dundermifflin/accounting
10.21.32.2:/home/accounting/www on /var/www/html/dundermifflin/accounting type nfs4 (ro,relatime,vers=4.2,rsize=131072,wsize=131072,namlen=255,soft,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=100.64.28.3,local_lock=none,addr=10.21.32.2)
/etc/auto.direct on /var/www/html/dundermifflin/accounting type autofs (rw,relatime,fd=6,pgrp=97681,timeout=300,minproto=5,maxproto=5,direct,pipe_ino=1194398)
10.21.32.2:/home/accounting/www on /var/www/html/dundermifflin/accounting type nfs4 (ro,relatime,vers=4.2,rsize=131072,wsize=131072,namlen=255,soft,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=100.64.28.3,local_lock=none,addr=10.21.32.2)
root@web0:~#
```

Test NFS access from Machine D:

```
[root@web1 ~]#  showmount -e 10.21.32.2
Export list for 10.21.32.2:
/home/accounting/www 100.64.28.0/24
[root@web1 ~]# mount | grep /var/www/html/dundermifflin/accounting
/etc/auto.direct on /var/www/html/dundermifflin/accounting type autofs (rw,relatime,fd=13,gid=1002,pgrp=175659,timeout=300,minproto=5,maxproto=5,direct,pipe_ino=2683172)
10.21.32.2:/home/accounting/www on /var/www/html/dundermifflin/accounting type nfs4 (ro,relatime,vers=4.2,rsize=131072,wsize=131072,namlen=255,soft,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=100.64.28.4,local_lock=none,addr=10.21.32.2)
[root@web1 ~]#
```

Verify Backup Web Server:
Place a test file on Machine E:
echo "bankai katen kyōkotsu karamatsu shinjū"> /home/accounting/www/test.html

Go to machine D and check:
curl http://100.64.28.4/accounting/test.html

```
root@web1:~
[root@web1 ~]# curl http://100.64.28.4/accounting/test.html
bankai katen kyōkotsu karamatsu shinjū
[root@web1 ~]#
```

Update the crontab for the backup server:

```
[root@web1 ~]# crontab -l
*/5 * * * * { echo "$(date '+\%H:\%M:\%S') - Starting backup"; rsync -avz --delete -x --exclude 'dundermifflin/accounting' root@100.64.28.3:/var/www/html/.
/var/www/html/.; echo "$(date '+\%H:\%M:\%S') - Backup completed"; } >> /var/log/rsync.log 2>&1

*/5 * * * * { echo "$(date '+\%H:\%M:\%S') - Starting cgi backup"; rsync -avz --delete root@100.64.28.3:/usr/lib/cgi-bin/. /var/www/cgi-bin/.; echo "$(date
'+\%H:\%M:\%S') - Backup completed"; } >> /var/log/rsync.log 2>&1
[root@web1 ~]#
```