

Презентация по лабораторной работе №12

Синхронизация времени

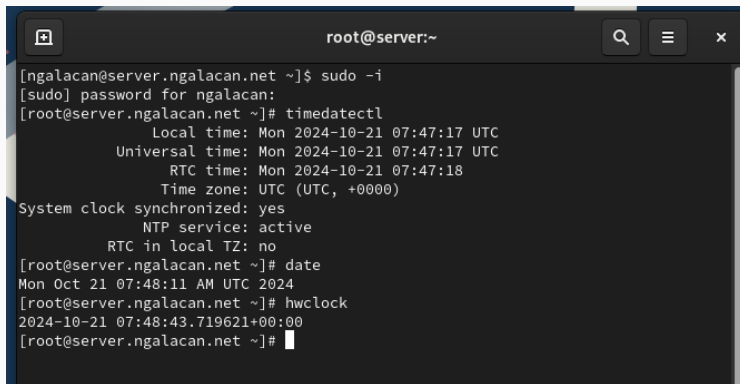
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Получение навыков по управлению системным временем и настройке синхронизации времени.

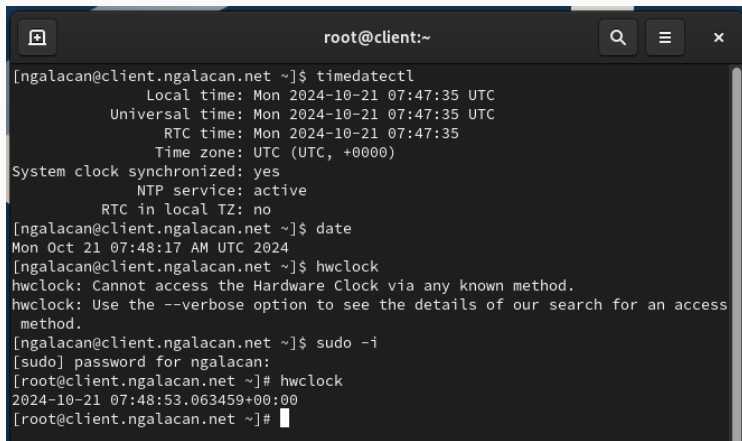
Настройка параметров времени



```
root@server:~  
[ngalacan@server.ngalacan.net ~]$ sudo -i  
[sudo] password for ngalacan:  
[root@server.ngalacan.net ~]# timedatectl  
    Local time: Mon 2024-10-21 07:47:17 UTC  
    Universal time: Mon 2024-10-21 07:47:17 UTC  
        RTC time: Mon 2024-10-21 07:47:18  
        Time zone: UTC (UTC, +0000)  
System clock synchronized: yes  
      NTP service: active  
    RTC in local TZ: no  
[root@server.ngalacan.net ~]# date  
Mon Oct 21 07:48:11 AM UTC 2024  
[root@server.ngalacan.net ~]# hwclock  
2024-10-21 07:48:43.719621+00:00  
[root@server.ngalacan.net ~]#
```

Рис. 1: Просмотр параметров настройки даты и времени на сервере

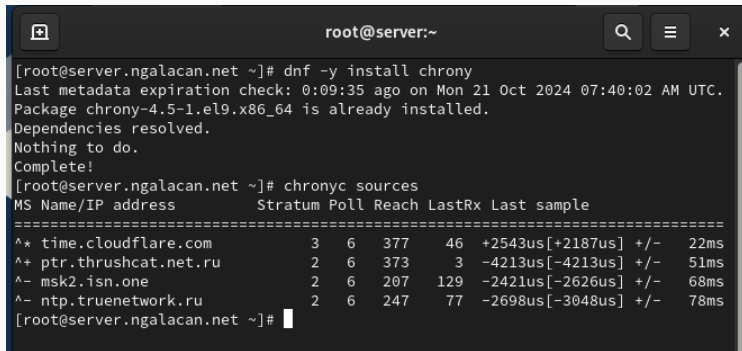
Выполнение лабораторной работы



```
root@client:~  
[ngalacan@client.ngalacan.net ~]$ timedatectl  
    Local time: Mon 2024-10-21 07:47:35 UTC  
    Universal time: Mon 2024-10-21 07:47:35 UTC  
        RTC time: Mon 2024-10-21 07:47:35  
        Time zone: UTC (UTC, +0000)  
System clock synchronized: yes  
      NTP service: active  
    RTC in local TZ: no  
[ngalacan@client.ngalacan.net ~]$ date  
Mon Oct 21 07:48:17 AM UTC 2024  
[ngalacan@client.ngalacan.net ~]$ hwclock  
hwclock: Cannot access the Hardware Clock via any known method.  
hwclock: Use the --verbose option to see the details of our search for an access  
method.  
[ngalacan@client.ngalacan.net ~]$ sudo -i  
[sudo] password for ngalacan:  
[root@client.ngalacan.net ~]# hwclock  
2024-10-21 07:48:53.063459+00:00  
[root@client.ngalacan.net ~]#
```

Рис. 2: Просмотр параметров настройки даты и времени на клиенте

Управление синхронизацией времени

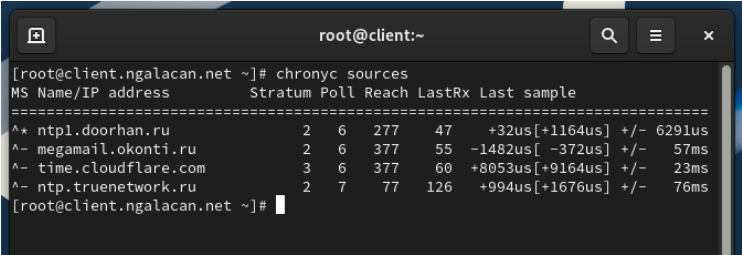


```
root@server:~  
[root@server.ngalacan.net ~]# dnf -y install chrony  
Last metadata expiration check: 0:09:35 ago on Mon 21 Oct 2024 07:40:02 AM UTC.  
Package chrony-4.5-1.el9.x86_64 is already installed.  
Dependencies resolved.  
Nothing to do.  
Complete!  
[root@server.ngalacan.net ~]# chronyc sources  
MS Name/IP address         Stratum Poll Reach LastRx Last sample  
=====
```

MS	Name/IP address	Stratum	Poll	Reach	LastRx	Last sample
^*	time.cloudflare.com	3	6	377	46	+2543us[+2187us] +/- 22ms
^+	ptr.thrushcat.net.ru	2	6	373	3	-4213us[-4213us] +/- 51ms
^-	msk2.isn.one	2	6	207	129	-2421us[-2626us] +/- 68ms
^-	ntp.truenetwork.ru	2	6	247	77	-2698us[-3048us] +/- 78ms

```
[root@server.ngalacan.net ~]#
```

Рис. 3: Источники времени на сервере

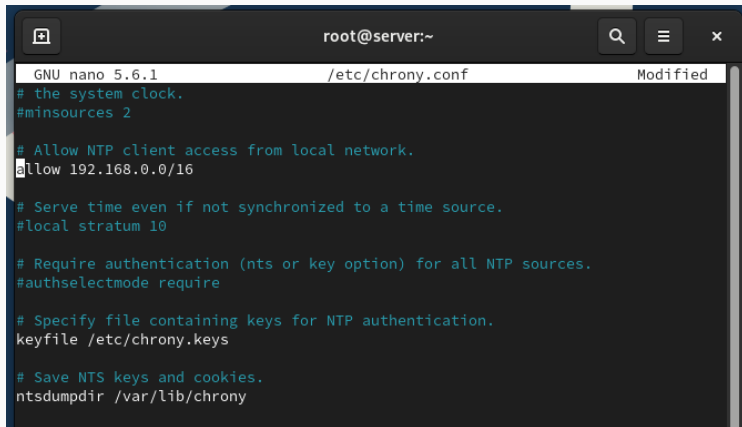
A terminal window titled 'root@client:~' with search, menu, and close buttons. It shows the command 'chronyc sources' and its output, which is a table of NTP sources. The output includes columns for MS Name/IP address, Stratum, Poll, Reach, LastRx, Last sample, and an unlabeled column with timing data. Four sources are listed: ntp1.doorhan.ru, megamail.okonti.ru, time.cloudflare.com, and ntp.truenetwork.ru.

```
root@client:~  
[root@client.ngalacan.net ~]# chronyc sources  
MS Name/IP address          Stratum Poll Reach LastRx Last sample  
=====
```

^* ntp1.doorhan.ru	2	6	277	47	+32us[+1164us]	+/- 6291us
^- megamail.okonti.ru	2	6	377	55	-1482us[-372us]	+/- 57ms
^- time.cloudflare.com	3	6	377	60	+8053us[+9164us]	+/- 23ms
^- ntp.truenetwork.ru	2	7	77	126	+994us[+1676us]	+/- 76ms

```
[root@client.ngalacan.net ~]#
```

Рис. 4: Источники времени на клиенте



The image shows a terminal window with a dark background. The title bar at the top reads "root@server:~". The terminal content shows the GNU nano 5.6.1 editor editing the file /etc/chrony.conf. The file content includes comments and configuration lines for Chrony, with the line "allow 192.168.0.0/16" being edited. The status bar at the bottom of the editor indicates "Modified".

```
GNU nano 5.6.1 /etc/chrony.conf Modified
# the system clock.
#minsources 2

# Allow NTP client access from local network.
allow 192.168.0.0/16

# Serve time even if not synchronized to a time source.
#local stratum 10

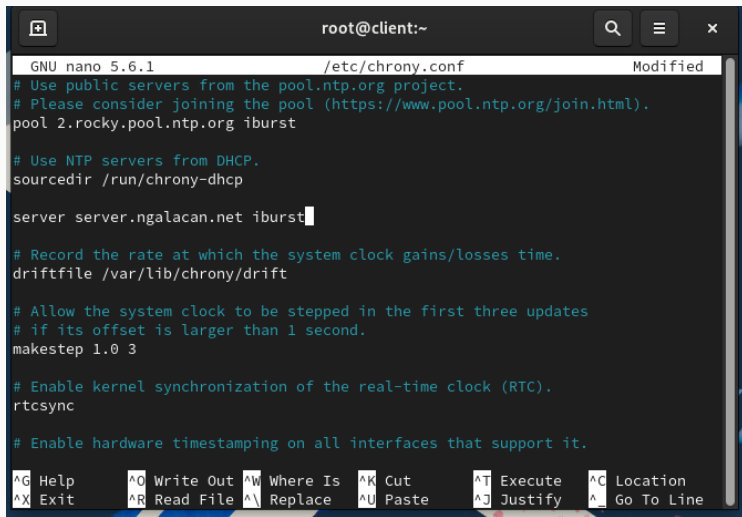
# Require authentication (nts or key option) for all NTP sources.
#authselectmode require

# Specify file containing keys for NTP authentication.
keyfile /etc/chrony.keys

# Save NTS keys and cookies.
ntsdumpdir /var/lib/chrony
```

Рис. 5: Редактирование /etc/chrony.conf на сервере

```
systemctl restart chronyd  
firewall-cmd --add-service=ntp --permanent  
firewall-cmd --reload
```



```
root@client:~  
GNU nano 5.6.1 /etc/chrony.conf Modified  
# 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  
  
# Use NTP servers from DHCP.  
sourcedir /run/chrony-dhcp  
  
server server.ngalacan.net iburst  
  
# 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.  
  
^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location  
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

Рис. 6: Редактирование /etc/chrony.conf на клиенте

Выполнение лабораторной работы

```
^* time.cloudflare.com 3 6 37 52 57us[+1620us] +/- 23ms
[root@server.ngalacan.net ~]# chronyc sources
MS Name/IP address          Stratum Poll Reach LastRx Last sample
=====
^~ ntp.truenetwork.ru        2  6  147  113 -7352us[-7259us] +/-  85ms
^~ 213.234.203.30            2  7   43   45  -16ms[ -16ms] +/-  92ms
^~ 85.93.46.10               2  6  377   53 -8460us[-8345us] +/- 112ms
^* time.cloudflare.com      3  6  377   52  +541us[ +657us] +/-  24ms
[root@server.ngalacan.net ~]# timedatectl
          Local time: Mon 2024-10-21 08:01:49 UTC
          Universal time: Mon 2024-10-21 08:01:49 UTC
             RTC time: Mon 2024-10-21 08:01:49
             Time zone: UTC (UTC, +0000)
System clock synchronized: yes
              NTP service: active
          RTC in local TZ: no
[root@server.ngalacan.net ~]#
```

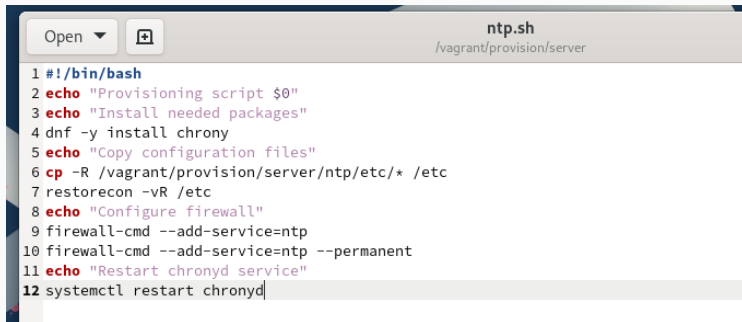
Рис. 7: Источники времени на сервере после внесения изменений

```
[root@client.ngalacan.net ~]# chronyc sources
MS Name/IP address          Stratum Poll Reach LastRx Last sample
=====
^~ time.cloudflare.com      3    6   17   37  +8519us[ -753us] +/-  23ms
^~ megamail.okonti.ru      2    6   17   35  -290us[-9135us] +/-  35ms
^~ time.cloudflare.com      3    6   17   37  +8053us[ -792us] +/-  23ms
^* ntp.ix.ru                1    6   17   33  -3852ns[-8848us] +/- 5336us
^~ server.ngalacan.net      4    6   17   36  +9250us[ +405us] +/-  25ms

[root@client.ngalacan.net ~]# nano /etc/chrony.conf
[root@client.ngalacan.net ~]# timedatectl
          Local time: Mon 2024-10-21 08:02:07 UTC
          Universal time: Mon 2024-10-21 08:02:07 UTC
             RTC time: Mon 2024-10-21 08:02:07
            Time zone: UTC (UTC, +0000)
System clock synchronized: yes
              NTP service: active
          RTC in local TZ: no
[root@client.ngalacan.net ~]# ss
```

Рис. 8: Источники времени на клиенте после внесения изменений

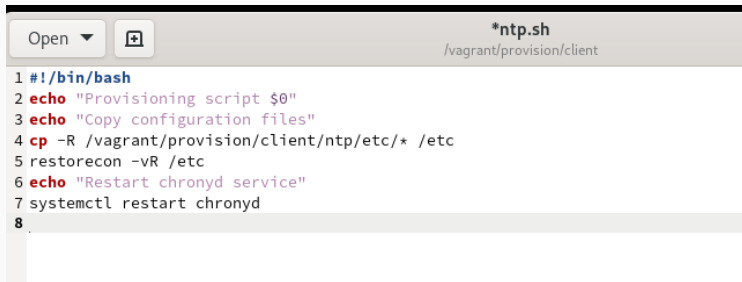
Внесение изменений в настройки
внутреннего окружения
виртуальной машины



The image shows a terminal window with a title bar. On the left, there is an 'Open' button with a dropdown arrow and a file icon. On the right, the title 'ntp.sh' is displayed above the path '/vagrant/provision/server'. The terminal content consists of 12 lines of a shell script. Line 1 is the shebang '#!/bin/bash'. Lines 2-3 are echo statements for provisioning and package installation. Line 4 is a dnf command to install chrony. Line 5 is an echo statement for copying configuration files. Line 6 is a cp command to copy ntp configuration files from a vagrant directory to /etc. Line 7 is a restorecon command. Line 8 is an echo statement for firewall configuration. Line 9 is a firewall-cmd command to add the ntp service. Line 10 is a firewall-cmd command to make the service permanent. Line 11 is an echo statement for restarting the chronyd service. Line 12 is a systemctl command to restart chronyd, which is currently being edited as indicated by a cursor at the end of the line.

```
1 #!/bin/bash
2 echo "Provisioning script $0"
3 echo "Install needed packages"
4 dnf -y install chrony
5 echo "Copy configuration files"
6 cp -R /vagrant/provision/server/ntp/etc/* /etc
7 restorecon -vR /etc
8 echo "Configure firewall"
9 firewall-cmd --add-service=ntp
10 firewall-cmd --add-service=ntp --permanent
11 echo "Restart chronyd service"
12 systemctl restart chronyd|
```

Рис. 9: Редактирование ntp.sh на сервере



The screenshot shows a terminal window with a title bar. On the left, there is an 'Open' button with a dropdown arrow and a file icon button. The title bar on the right displays '*ntp.sh' and the file path '/vagrant/provision/client'. The terminal content shows a sequence of commands being executed or edited, with line numbers 1 through 8 visible on the left margin. The commands are: 1. `#!/bin/bash`, 2. `echo "Provisioning script $0"`, 3. `echo "Copy configuration files"`, 4. `cp -R /vagrant/provision/client/ntp/etc/* /etc`, 5. `restorecon -vR /etc`, 6. `echo "Restart chronyd service"`, 7. `systemctl restart chronyd`, and 8. A blank line.

```
1 #!/bin/bash
2 echo "Provisioning script $0"
3 echo "Copy configuration files"
4 cp -R /vagrant/provision/client/ntp/etc/* /etc
5 restorecon -vR /etc
6 echo "Restart chronyd service"
7 systemctl restart chronyd
8
```

Рис. 10: Редактирование ntp.sh на клиенте

```
server.vm.provision "server ntp",  
  type: "shell",  
  preserve_order: true,  
  path: "provision/server/ntp.sh"  
client.vm.provision "client ntp",  
  type: "shell",  
  preserve_order: true,  
  path: "provision/client/ntp.sh"
```

В результате выполнения работы были приобретены практические навыки по управлению системным временем и настройке синхронизации времени.