

Лабораторная работа №12

Администрирование сетевых подсистем

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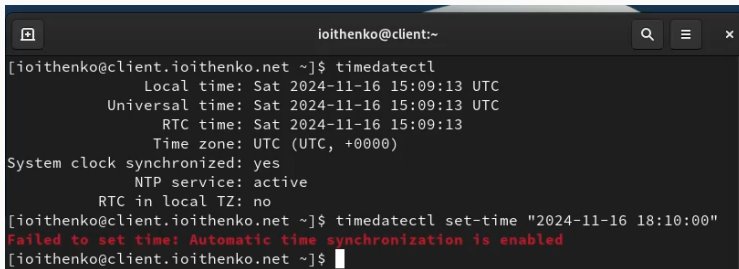
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Приобретение практических навыков по управлению системным временем и настройке синхронизации времени.

Выполнение лабораторной работы

```
ioithenko@server:~ — timedatectl list-timezones
[ioithenko@server.ioithenko.net ~]$ timedatectl
    Local time: Sat 2024-11-16 15:08:46 UTC
    Universal time: Sat 2024-11-16 15:08:46 UTC
    RTC time: Sat 2024-11-16 15:08:47
    Time zone: UTC (UTC, +0000)
System clock synchronized: yes
    NTP service: active
    RTC in local TZ: no
[ioithenko@server.ioithenko.net ~]$ timedatectl list-timezones
Africa/Abidjan
Africa/Accra
Africa/Addis_Ababa
Africa/Algiers
Africa/Asmara
Africa/Asmera
Africa/Bamako
Africa/Bangui
Africa/Banjul
Africa/Bissau
Africa/Blantyre
Africa/Brazzaville
Africa/Bujumbura
Africa/Cairo
Africa/Casablanca
Africa/Ceuta
Africa/Conakry
Africa/Dakar
Africa/Dar_es_Salaam
Africa/Djibouti
Africa/Douala
Africa/El_Aaiun
Africa/Freetown
Africa/Gaborone
```

Рис. 1: Команда timedatectl на сервере

A terminal window titled 'ioithenko@client:~' with standard window controls (minimize, maximize, close) and search, menu, and close buttons. The terminal shows the output of the 'timedatectl' command, displaying system time details. The second command, 'timedatectl set-time "2024-11-16 18:10:00"', is shown with a red error message indicating that automatic time synchronization is enabled.

```
[ioithenko@client.ioithenko.net ~]$ timedatectl
      Local time: Sat 2024-11-16 15:09:13 UTC
      Universal time: Sat 2024-11-16 15:09:13 UTC
          RTC time: Sat 2024-11-16 15:09:13
          Time zone: UTC (UTC, +0000)
System clock synchronized: yes
          NTP service: active
          RTC in local TZ: no
[ioithenko@client.ioithenko.net ~]$ timedatectl set-time "2024-11-16 18:10:00"
Failed to set time: Automatic time synchronization is enabled
[ioithenko@client.ioithenko.net ~]$
```

Рис. 2: Команда timedatectl на клиенте

```
[ioithenko@server.ioithenko.net ~]$ date  
Sat Nov 16 03:10:59 PM UTC 2024  
[ioithenko@server.ioithenko.net ~]$ date 111618112024  
date: cannot set date: Operation not permitted  
Sat Nov 16 06:11:00 PM UTC 2024
```

Рис. 3: Просмотр текущего системного времени на сервере

```
method:  
[ioithenko@server.ioithenko.net ~]$ sudo hwclock  
[sudo] password for ioithenko:  
2024-11-16 15:12:02.108195+00:00  
[ioithenko@server.ioithenko.net ~]$
```

Рис. 4: Просмотр аппаратного времени на клиенте

```
[ioithenko@client.ioithenko.net ~]$ date  
Sat Nov 16 03:10:44 PM UTC 2024  
[ioithenko@client.ioithenko.net ~]$ sudo hwclock  
[sudo] password for ioithenko:  
2024-11-16 15:12:25.451151+00:00  
[ioithenko@client.ioithenko.net ~]$
```

Рис. 5: Просмотр текущего системного и аппаратного времени на клиенте


```

2024-11-16 13:12:02.108193+00:00
[ioithenko@server.ioithenko.net ~]$ sudo dnf -y install chrony
Extra Packages for Enterprise Linux 9 - x86_64 9.0 kB/s | 41 kB 00:04
Extra Packages for Enterprise Linux 9 - x86_64 1.6 MB/s | 23 MB 00:14
Extra Packages for Enterprise Linux 9 openh264 1.5 kB/s | 993 B 00:00
Rocky Linux 9 - BaseOS 1.3 kB/s | 4.1 kB 00:03
Rocky Linux 9 - BaseOS 1.3 MB/s | 2.3 MB 00:01
Rocky Linux 9 - AppStream 7.4 kB/s | 4.5 kB 00:00
Rocky Linux 9 - AppStream 1.1 MB/s | 8.0 MB 00:07
Rocky Linux 9 - Extras 4.8 kB/s | 2.9 kB 00:00
Package chrony-4.5-1.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[ioithenko@server.ioithenko.net ~]$ chronyc sources
MS Name/IP address Stratum Poll Reach LastRx Last sample
=====
^~ 192.36.143.130 1 6 377 107 -7758us[-1925us] +/- 24ms
^~ server.brandport.ru 2 6 377 35 -1102us[-1102us] +/- 90ms
^* time.cloudflare.com 3 6 377 63 +4373us[ +11ms] +/- 12ms
^~ time.cloudflare.com 3 6 377 5 +10ms[ +11ms] +/- 14ms
[ioithenko@server.ioithenko.net ~]$

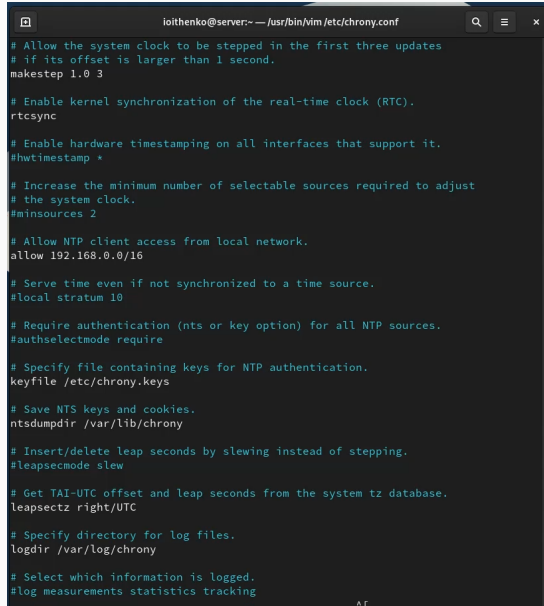
```

Рис. 6: Просмотр источников времени на сервере

```
[ioithenko@client.ioithenko.net ~]$ chronyc sources
```

MS	Name/IP address	Stratum	Poll	Reach	LastRx	Last sample
^-	server.brandport.ru	2	6	367	176	+52ms[+64ms] +/- 74ms
^*	time.cloudflare.com	3	6	375	45	+13ms[+25ms] +/- 14ms
^-	time100.stupi.se	1	6	377	47	+28ms[+40ms] +/- 49ms
^+	time.cloudflare.com	3	6	377	49	+12ms[+24ms] +/- 14ms

Рис. 7: Просмотр источников времени на клиенте



```
ioithenko@server:~ — /usr/bin/vim /etc/chrony.conf
# 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 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

# Insert/delete leap seconds by slewing instead of stepping.
#leapsecmode slew

# Get TAI-UTC offset and leap seconds from the system tz database.
leapsectz right/UTC

# Specify directory for log files.
logdir /var/log/chrony

# Select which information is logged.
#log measurements statistics tracking
```

Рис. 8: Разрешение NTP работать из локальной сети

```
[ioithenko@server.ioithenko.net ~]$ systemctl restart chronyd
[ioithenko@server.ioithenko.net ~]$ sudo -i
[root@server.ioithenko.net ~]# firewall-cmd --add-service=ntp --permanent
success
[root@server.ioithenko.net ~]# firewall-cmd --reload
success
[root@server.ioithenko.net ~]#
```

Рис. 9: Настройка межсетевого экрана

```
ioithenko@client:~ — sudo vi /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

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

server server.ioithenko.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.
#hwtimestamp *

# Increase the minimum number of selectable sources required to adjust
# 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.
:~wq
```

Рис. 10: Настройка сервера в качестве сервера синхронизации времени

```

success
[root@server.ioithenko.net ~]# chronyc sources
MS Name/IP address         Stratum Poll Reach LastRx Last sample
=====
^* ntp.kaluga.net           2    6   367    3  +2751us[+5110us] +/-   15ms
^? time100.stupi.se         1    6    17   123   -12ms[ -11ms] +/-   25ms
^? 89-179-240-219.static.co> 0    8     0    -    +0ns[ +0ns] +/-    0ns
[root@server.ioithenko.net ~]# chronyc tracking
Reference ID      : C37071FD (ntp.kaluga.net)
Stratum          : 3
Ref time (UTC)   : Sat Nov 16 15:22:51 2024
System time      : 0.000972204 seconds fast of NTP time
Last offset      : +0.002358878 seconds
RMS offset       : 0.008527357 seconds
Frequency        : 479.364 ppm fast
Residual freq    : +4.033 ppm
Skew             : 85.019 ppm
Root delay       : 0.016838877 seconds
Root dispersion  : 0.012563884 seconds
Update interval  : 64.5 seconds
Leap status      : Normal
[root@server.ioithenko.net ~]#

```

Рис. 11: Просмотр источников времени на сервере

```

[ioithenko@client.ioithenko.net ~]$ systemctl restart chronyd
[ioithenko@client.ioithenko.net ~]$ chronyc sources
MS Name/IP address          Stratum Poll Reach LastRx Last sample
=====
^? 89-179-240-219.static.co> 0    7    0    -    +0ns[  +0ns] +/-    0ns
^- time100.stupi.se         1    6   53   13   -11ms[ -11ms] +/-   24ms
^* ns.ioithenko.net         3    6   17   17   +125us[ -747us] +/-  14ms
[ioithenko@client.ioithenko.net ~]$

```

Рис. 12: Просмотр источников времени на клиенте

```
[ioithenko@client.ioithenko.net ~]$ chronyc tracking
Reference ID      : C0A80101 (dhcp.ioithenko.net)
Stratum          : 4
Ref time (UTC)   : Sat Nov 16 15:23:10 2024
System time      : 0.000000307 seconds slow of NTP time
Last offset      : +0.007264765 seconds
RMS offset       : 0.007264765 seconds
Frequency        : 423.282 ppm fast
Residual freq    : +47.684 ppm
Skew             : 273.302 ppm
Root delay       : 0.017419416 seconds
Root dispersion  : 0.026654750 seconds
Update interval  : 64.2 seconds
Leap status      : Normal
[ioithenko@client.ioithenko.net ~]$
```

Рис. 13: Просмотр источников времени на клиенте

В ходе выполнения лабораторной работы я приобрела практические навыки по управлению системным временем и настройке синхронизации времени.