Astra Linux

-
-
  - chrony ntp
  - systemd-timesyncd
-
- chrony
  - chronyd
    - IPv6
- ntp
  -
  - ntpdate
  - ntp ntpq
  - ntp DNS
  -
  -
- openntpd
- systemd-timesyncd
  -
- (RTC)
  -
  -
  - RTC Windows
- Ansible Puppet

:

- Astra Linux Special Edition .10015-01 (1.7)
- Astra Linux Special Edition .10152-02 (4.7)
- Astra Linux Special Edition .10015-01 (1.6)
- Astra Linux Special Edition .10015-16 . 1 . 2
- Astra Linux Special Edition .10265-01 (8.1)
- Astra Linux Common Edition 2.12

() . .

(ntp chrony) . systemd-timesyncd:

```
sudo apt purge ntp
sudo apt purge chrony
sudo timedatectl set-ntp true
sudo systemctl start systemd-timesyncd
```

:

```
systemctl status systemd-timesyncd
```

. systemd-timesyncd.

chrony ntp

, - . :

- Astra Linux Special Edition x.7 — chrony;
- Astra Linux Special Edition Astra Linux Common Edition — ntp.

:

```
sudo systemctl stop ntp chrony
sudo ntpdate -u <_>
sudo systemctl start ntp chrony
```

<_>:

- IP- (,);
- IP-/ .

, ntp1.vniiftri.ru (IP- 89.109.251.21) :

```
sudo systemctl stop ntp chrony
sudo ntpdate -u 89.109.251.21
sudo systemctl start ntp chrony
```

systemd-timesyncd

systemd-timesyncd :

```
sudo systemctl restart systemd-timesyncd.service
```

Astra Linux , NTP:

- **chronyd** (chrony). Astra Linux Special Edition .10015-01 1.7 Astra Linux Common Edition 2.12.43. Astra Linux (PTP timedatectl, .) . , . FreeIPA (. FreeIPA Astra Linux) FreeIPA 4.8.5.
- **ntp** (ntp ntpdate). , .

  ntp 123 .
  - 123 , :
    - Astra Linux Special Edition x.7 - chronyd;
    - ;
    - ntp , 123 ;
    - ntpdate (.);
    - **openntpd** (.);
    - **systemd-timesyncd** (.);
- **openntpd** (openntpd). , . **Astra Linux Common Edition 2.12.26** NTP. Astra Linux Special Edition Astra Linux Common Edition. NTP:
  - 123, , ntp - , 123 , ;
  - , , NTP. . openntpd;
  - NTP;
- **timedatectl / systemd-timesyncd.service**. , .
  , .
  , .

ntp, chronyd timesyncd, .

timesyncd . .

systemd-timesyncd.service , :

- NTP ( );
- openntpd ( );
- chronyd ( );
- Oracle Virtual Box (,).

- **PTP (Precision Time Protocol)** - .

, :

Universal time, UTC	**UTC** — , , . **UTC** . **UTC** (GMT). **UTC** Coordinated Universal Time (-) Temps universel coordonné (-). , , : • ; • ; • .	Universal time: 2019-02-20 07:51:49 UTC
Time Zone	. (/) .	Time zone: Europe/Moscow (MSK, +0300)
Local time	, . , . +3 (Time zone: Europe/Moscow (MSK, +0300)). .	Local time: 2019-02-20 10:51:49 MSK
RTC time	. , (Real Time Clock, RTC, CMOS BIOS time). . , . (UTC) (UTC) , (UTC) , (. man timedatectl). UTC. , . Linux- , UTC. Windows , _. , . Astra Linux Special Edition .10015-01 (1.5) Windows RTC . RTC , Astra Linux , UTC.	RTC time: 2019-02-20 07:51:49 , (, Raspberry Pi) , .

chrony

Astra Linux Special Edition x.7 Astra Linux Common Edition 2.12.43 chrony (chronyd) - , ntp. Astra Linux chrony Debian.

, chronyd, ntp:

1. , , ;
2. ;
3. , IP- 123 (.. , ntp 123).

chrony :

```
sudo apt install chrony
```

chrony ntp.
FreeIPA (4.8.5 . . FreeIPA Astra Linux) chrony , ntp.

chronyd " " , .

FreeIPA chronyd .

chronyd /etc/chrony/chrony.conf. .

" " chronyd . (..), , - :

```
allow
```

chronyd:

```
sudo systemctl restart chronyd
```

. :

```
man chrony.conf
```

chronyd

IPv6

, chronyd IPv6 (, IPv6):

1. /etc/default/chrony DAEMON_OPTS -4. :

   ```
   DAEMON_OPTS="-F -1 -4"
   ```

2. chronyd:

   ```
   sudo systemctl restart chronyd
   ```

ntp

Astra Linux, , . :

```
systemctl status ntp
```

, :

```
sudo systemctl enable ntp
sudo systemctl start ntp
```

, , , .

ntp , , , .

fly-admin-ntp, , :

```
sudo apt install fly-admin-ntp
```

:

-> -> -> (NTP).

,
`/etc/ntp.conf`.

" " ntpd , , . ntp (/etc/ntp.conf):

```
# /etc/ntp.conf, configuration for ntpd; see ntp.conf(5) for help

driftfile /var/lib/ntp/ntp.drift

# Enable this if you want statistics to be logged.
#statsdir /var/log/ntpstats/

statistics loopstats peerstats clockstats
filegen loopstats file loopstats type day enable
filegen peerstats file peerstats type day enable
filegen clockstats file clockstats type day enable


# You do need to talk to an NTP server or two (or three).
#server ntp.your-provider.example

# pool.ntp.org maps to about 1000 low-stratum NTP servers. Your server will
# pick a different set every time it starts up. Please consider joining the
# pool: <http://www.pool.ntp.org/join.html>
pool 0.debian.pool.ntp.org iburst
pool 1.debian.pool.ntp.org iburst
pool 2.debian.pool.ntp.org iburst
pool 3.debian.pool.ntp.org iburst


# Access control configuration; see /usr/share/doc/ntp-doc/html/accopt.html for
# details. The web page <http://support.ntp.org/bin/view/Support/AccessRestrictions>
# might also be helpful.
#
# Note that "restrict" applies to both servers and clients, so a configuration
# that might be intended to block requests from certain clients could also end
# up blocking replies from your own upstream servers.

# By default, exchange time with everybody, but don't allow configuration.
restrict -4 default kod notrap nomodify nopeer noquery limited
restrict -6 default kod notrap nomodify nopeer noquery limited

# Local users may interrogate the ntp server more closely.
restrict 127.0.0.1
restrict ::1

# Needed for adding pool entries
restrict source notrap nomodify noquery

# Clients from this (example!) subnet have unlimited access, but only if
# cryptographically authenticated.
#restrict 192.168.123.0 mask 255.255.255.0 notrust


# If you want to provide time to your local subnet, change the next line.
# (Again, the address is an example only.)
#broadcast 192.168.123.255

# If you want to listen to time broadcasts on your local subnet, de-comment the
# next lines. Please do this only if you trust everybody on the network!
#disable auth
#broadcastclient
```

, :

```
# IPv4
restrict -4 default kod notrap nomodify nopeer noquery limited

# IPv6
restrict -6 default kod notrap nomodify nopeer noquery limited
```

:

- kod — , (, kiss of death),
- notrap —
- nomodify — ,
- nopeer —
- noquery —
- limited —

, . , 192.168.0.0

```
# 192.168.0.0,
restrict 192.168.0.0 mask 255.255.255.0 nomodify notrap

#
restrict 127.0.0.1
restrict ::1
```

, , .

:

```
sudo service ntp restart
```

ntp

ntp ntpq, .
.

:

```
ntpq -p
```

:

```
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 0.ru.pool.ntp.o .POOL.          16 p    -   64    0    0.000    0.000   0.000
 1.ru.pool.ntp.o .POOL.          16 p    -   64    0    0.000    0.000   0.000
 2.ru.pool.ntp.o .POOL.          16 p    -   64    0    0.000    0.000   0.000
 3.ru.pool.ntp.o .POOL.          16 p    -   64    0    0.000    0.000   0.000
 127.127.1.0     .LOCL.          10 l 1101   64    0    0.000    0.000   0.000
+185.209.85.222  195.91.239.8     2 u   20   64  377   10.631    0.690   0.355
*195.91.239.8    .PPS.            1 u   19   64  377    1.256    0.081   0.065
+192.36.143.130  .PPS.            1 u   18   64  377   19.755    0.129   0.330
-37.193.156.169  80.242.83.227    2 u   12   64  377   44.877   -0.832   2.427
-95.165.138.248  89.109.251.24    2 u    7   64  377    3.118    0.241   0.140
```

:

- - :
  - ***** — ;
  - **+** — ;
  - **o** — PPS- ( );
  - — ;
  - **— x** . — «» () .
- remote - ;
- refid - , .
  ((pool)), .
  , ;
- st - () . 0 16. - .
  16 , ;
- t - (u - unucast, m - multicast, l - local, p - pool ..);

- when - , ( ), , ;
- poll - ( );
- reach - .
  , 100% 0, 1, 3, 7, 17, 37, 77, 177, 377 377;
- delay - ( );
- offset - ;
- jitter- ()

ntpdate

ntpdate.

, :

- no server suitable for synchronization found - , , ntpd, , , ;
- leap not in sync - , . , , .

(, cron).

ntpdate , :

```
sudo apt install ntpdate
```

:

- (-q):

  ```
  sudo ntpdate -q 0.ru.pool.ntp.org
  ```

- (-d , ,):

  ```
  sudo ntpdate -d 0.ru.pool.ntp.org
  ```

- IP- 123 ( ). , 123 :

  ```
  sudo ntpdate -u 0.ru.pool.ntp.org
  ```

  ntpdate IP- (123) ntpd, , ntpd , ntpdate , :

  ```
  sudo ntpdate -q 0.ru.pool.ntp.org
  ```

  ```
  ntpdate[1421]: the NTP socket is in use, exiting
  ```

  , IP-, 123, -u.

  IP- 123 , ntpdate -u ntpd (, ntpd):

  ```
  sudo service ntp stop
  sudo ntpdate -q 0.ru.pool.ntp.org
  sudo ntpdate -qu 0.ru.pool.ntp.org
  sudo service ntp start
  ```

  ntpdate ("-q") , ("-qu") , IP- 123, NTP , OpenNTPD, chrony, systemd-timesyncd).

- ntpdate :

  ```
  sudo ntpdate -ubv 0.ru.pool.ntp.org
  ```

. . ntpdate

ntp ntpq

ntp :

```
sudo ntpq -c sysinfo
```

( ):

```
associd=0 status=c016 leap_alarm, sync_unspec, 1 event, restart,
system peer:        0.0.0.0:0
system peer mode:   unspec
leap indicator:     11
stratum:            16
log2 precision:     -24
root delay:         0.000
root dispersion:    0.300
reference ID:       INIT
reference time:     (no time)
system jitter:      0.000000
clock jitter:       0.000
clock wander:       0.000
broadcast delay:    -50.000
symm. auth. delay:  0.000
```

( ):

```
associd=0 status=0614 leap_none, sync_ntp, 1 event, freq_mode,
system peer:        ntp3.vniiftri.ru:123
system peer mode:   client
leap indicator:     00
stratum:            2
log2 precision:     -24
root delay:         5.638
root dispersion:    187.866
reference ID:       89.109.251.23
reference time:     e8188920.f000d2a1  Wed, May 24 2023 16:01:20.937
system jitter:      0.000000
clock jitter:       0.997
clock wander:       0.000
broadcast delay:    -50.000
symm. auth. delay:  0.000
```

ntp DNS

DNS-. . DNS- BIND9

:

-
-
-

, ,
:

pool 0.debian.pool.ntp.org iburst
pool 1.debian.pool.ntp.org iburst
pool 2.debian.pool.ntp.org iburst
pool 3.debian.pool.ntp.org iburst

, ntp , ( ), , DNS.
DNS , IP-.
, DNS , .

:

```
pool 0.ru.pool.ntp.org iburst
pool 1.ru.pool.ntp.org iburst
pool 2.ru.pool.ntp.org iburst
pool 3.ru.pool.ntp.org iburst
```

, , : http://vniiftri.ru/ru/uslugi-serverov

, , :

```
server <IP___1>
server <IP___2>
```

openntpd

Astra Linux Common Edition :

```
sudo apt install opnntpd
```

, , .

openntpd /etc/openntpd/ntpd.conf. openntpd ntp. :

```
# $OpenBSD: ntpd.conf,v 1.14 2015/07/15 20:28:37 ajacoutot Exp $
# sample ntpd configuration file, see ntpd.conf(5)

# Addresses to listen on (ntpd does not listen by default)
listen on *
#listen on 127.0.0.1
#listen on ::1

# sync to a single server
#server ntp.example.org

# use a random selection of NTP Pool Time Servers
# see http://support.ntp.org/bin/view/Servers/NTPPoolServers
#servers pool.ntp.org

# Choose servers announced from Debian NTP Pool
servers ntp21.vniiftri.ru
#servers 0.debian.pool.ntp.org
#servers 1.debian.pool.ntp.org
#servers 2.debian.pool.ntp.org
#servers 3.debian.pool.ntp.org

# use a specific local timedelta sensor (radio clock, etc)
#sensor nmea0

# use all detected timedelta sensors
#sensor *
```

ntp21.vniiftri.ru , .
, 123 :

```
# Addresses to listen on (ntpd does not listen by default)
listen on *
```

, , :

```
sudo systemctl restart openntpd
```

openntpd NTP, openntpd ntpq ntpdate (ntpq , ntp).

systemd-timesyncd

timesyncd "" ntp. , , .

> timesyncd , .

timesyncd , , , , ntp chronyd, ( ).

:

```
sudo timedatectl set-ntp false
```

, , (, ntp (openntpd chronyd), timesyncd):

```
sudo timedatectl set-ntp true
```

timesyncd ntp openntpd ( ):

```
sudo apt purge ntp openntpd
```

chronyd :

```
sudo apt purge chrony
```

timesyncd:

```
sudo systemctl start systemd-timesyncd
```

:

```
systemctl status systemd-timesyncd
```

:

```
sudo timedatectl status
```

:

```
      Local time: 2018-12-26 11:08:12 MSK
  Universal time: 2018-12-26 08:08:12 UTC
        RTC time: 2018-12-26 08:08:12
       Time zone: Europe/Moscow (MSK, +0300)
 Network time on: yes
NTP synchronized: yes
 RTC in local TZ: no
```

timesyncd . /etc/systemd/timesyncd.conf. Astra Linux Special Edition x.7 :

```
#FallbackNTP=0.ru.pool.ntp.org 1.ru.pool.ntp.org 2.ru.pool.ntp.org 3.ru.pool.ntp.org ntp3.vniiftri.ru ntp4.
vniiftri.ru ntp21.vniiftri.ru vniiftri2.khv.ru ntp2.niiftri.irkutsk.ru ntp3.stratum2.ru ntp2.stratum2.ru
```

, (.) , .

timesyncd systemd-networkd, systemd-networkd , .. (/lib/systemd/network/, /run/systemd/network/, /etc/systemd/network/ /lib/) NTP, (. man systemd.network).

timesyncd

/etc/systemd/timesyncd.conf
/etc/systemd/timesyncd.conf.d/*.conf
/run/systemd/timesyncd.conf.d/*.conf
/usr/lib/systemd/timesyncd.conf.d/*.conf

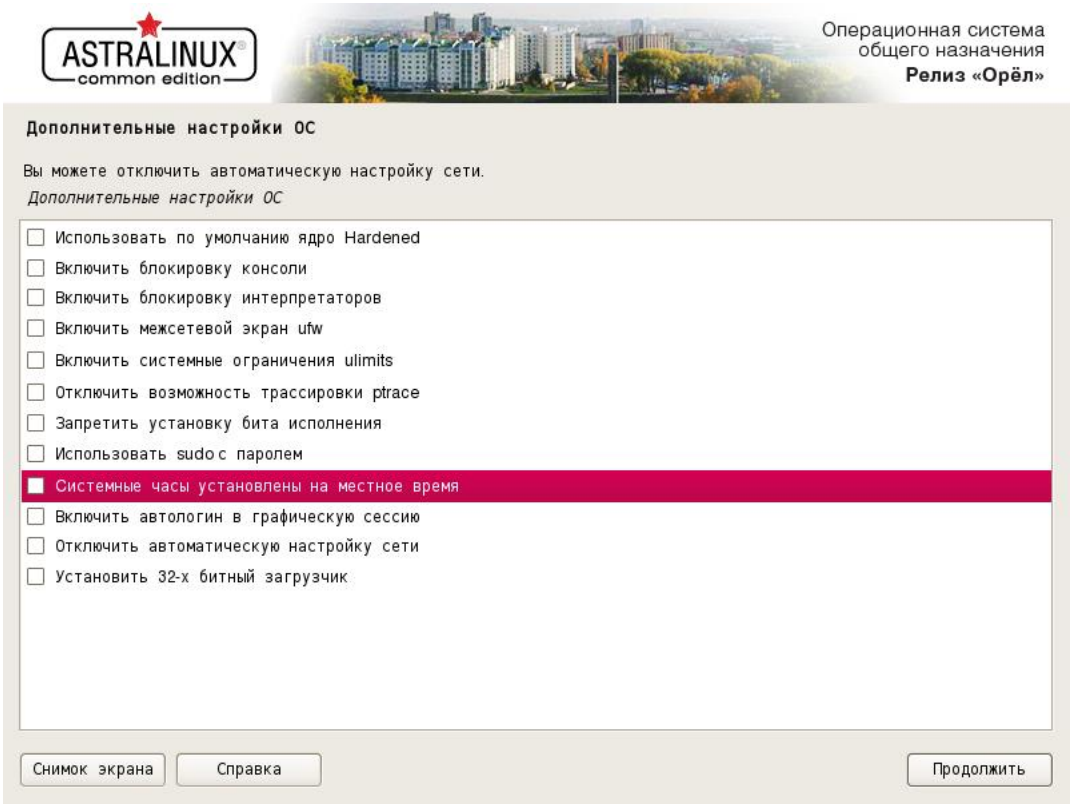
:

- NTP= - NTP-. systemd-networkd. .
- FallbackNTP= NTP-.

TIMESYNCD , , , .

(RTC)

Astra Linux Common Edition 2.12 " ", " ":



, , (UTC).
, .
RT UTC, , timedatectl status .

UTC :

```
sudo timedatectl  set-local-rtc 0
```

RTC --adjust-system-clock.

:

```
sudo timedatectl  set-local-rtc 1
```

RTC Windows

, .

Windows UTC, [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\TimeZoneInformation] "RealTimeIsUniversal", :

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\TimeZoneInformation] "RealTimeIsUniversal"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\TimeZoneInformation] "RealTimeIsUniversal"=qword:00000001

Ansible Puppet

. Ansible Puppet