

Лабораторная работа 8

Планировщики событий

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Получение навыков работы с планировщиками событий **cron** и **at**.

1. Планирование задач с помощью `cron`
2. Планирование задач с помощью `atd`

Проверка статуса crond

```
Activities Terminal Sep 8 18:16 en
root@ndbaranov:~

[baranov@ndbaranov ~]$ su -
Password:
[root@ndbaranov ~]# systemctl status crond -l
* crond.service - Command Scheduler
   Loaded: loaded (/usr/lib/systemd/system/crond.service; enabled; preset: enabled)
   Active: active (running) since Mon 2025-09-08 17:27:32 MSK; 49min ago
   Main PID: 1154 (crond)
     Tasks: 2 (limit: 22982)
    Memory: 1.5M
       CPU: 91ms
   CGroup: /system.slice/crond.service
           └─1154 /usr/sbin/crond -n
             5608 /usr/sbin/anacron -s

Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) STARTUP (1.5.7)
Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) INFO (Syslog will be used instead of sendmail.)
Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) INFO (RANDOM_DELAY will be scaled with factor 93% if used.)
Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) INFO (running with inotify support)
Sep 08 18:01:01 ndbaranov CROND[5595]: (root) CMD (run-parts /etc/cron.hourly)
Sep 08 18:01:02 ndbaranov anacron[5608]: Anacron started on 2025-09-08
Sep 08 18:01:02 ndbaranov anacron[5608]: Will run job 'cron.daily' in 39 min.
Sep 08 18:01:02 ndbaranov anacron[5608]: Jobs will be executed sequentially
Sep 08 18:01:02 ndbaranov run-parts[5610]: (/etc/cron.hourly) finished @anacron
Sep 08 18:01:02 ndbaranov CROND[5594]: (root) CMDEND (run-parts /etc/cron.hourly)
lines 1-21/21 [END] ... skipping...
* crond.service - Command Scheduler
   Loaded: loaded (/usr/lib/systemd/system/crond.service; enabled; preset: enabled)
   Active: active (running) since Mon 2025-09-08 17:27:32 MSK; 49min ago
   Main PID: 1154 (crond)
     Tasks: 2 (limit: 22982)
    Memory: 1.5M
       CPU: 91ms
   CGroup: /system.slice/crond.service
           └─1154 /usr/sbin/crond -n
             5608 /usr/sbin/anacron -s

Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) STARTUP (1.5.7)
Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) INFO (Syslog will be used instead of sendmail.)
Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) INFO (RANDOM_DELAY will be scaled with factor 93% if used.)
Sep 08 17:27:32 ndbaranov crond[1154]: (CRON) INFO (running with inotify support)
Sep 08 18:01:01 ndbaranov CROND[5595]: (root) CMD (run-parts /etc/cron.hourly)
Sep 08 18:01:02 ndbaranov anacron[5608]: Anacron started on 2025-09-08
Sep 08 18:01:02 ndbaranov anacron[5608]: Will run job 'cron.daily' in 39 min.
Sep 08 18:01:02 ndbaranov anacron[5608]: Jobs will be executed sequentially
Sep 08 18:01:02 ndbaranov run-parts[5610]: (/etc/cron.hourly) finished @anacron
Sep 08 18:01:02 ndbaranov CROND[5594]: (root) CMDEND (run-parts /etc/cron.hourly)
```

Просмотр /etc/crontab

```
Activities Terminal Sep 8 18:17 en
root@ndbaranov:~
Sep 08 18:01:02 ndbaranov anacron[5608]: Jobs will be executed sequentially
Sep 08 18:01:02 ndbaranov run-parts[5610]: (/etc/cron.hourly) finished 0anacron
Sep 08 18:01:02 ndbaranov CROND[5594]: (root) CMDEND (run-parts /etc/cron.hourly)

[root@ndbaranov ~]# cat /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root

# For details see man 4 crontabs

# Example of job definition:
# .----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .----- day of month (1 - 31)
# | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# * * * * * user-name command to be executed

[root@ndbaranov ~]# crontab -l
no crontab for root
[root@ndbaranov ~]#
```

Проверка crontab -l

```
Activities Terminal Sep 8 18:17 en
root@ndbaranov:~
Sep 08 18:01:02 ndbaranov anacron[5608]: Jobs will be executed sequentially
Sep 08 18:01:02 ndbaranov run-parts[5610]: (/etc/cron.hourly) finished 0anacron
Sep 08 18:01:02 ndbaranov CROND[5594]: (root) CMDEND (run-parts /etc/cron.hourly)

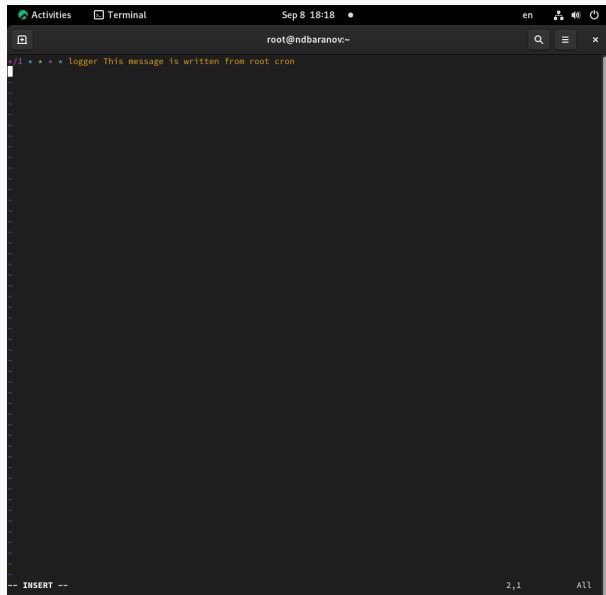
[root@ndbaranov ~]# cat /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root

# For details see man 4 crontabs

# Example of job definition:
# .----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .----- day of month (1 - 31)
# | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# * * * * * user-name command to be executed

[root@ndbaranov ~]# crontab -l
no crontab for root
[root@ndbaranov ~]#
```

Добавление задания в crontab



A terminal window titled "Terminal" with a dark background. The window shows a root prompt at "root@ndbaranov:~". The first line of output is a cron job entry: `* /1 * * * * logger This message is written from root cron`. The entry is highlighted with a blue dashed border. At the bottom of the terminal, there is a status bar with the text `-- INSERT --` on the left, `2,1` in the center, and `All` on the right.

```
Activities Terminal Sep 8 18:18 en [search] [menu] [close]
root@ndbaranov:~
*/1 * * * * logger This message is written from root cron
-- INSERT -- 2,1 All
```


Проверка добавленного задания

```
Activities Terminal Sep 8 18:25 en [search] [menu] [close]
root@ndbaranov:~

[root@ndbaranov ~]# cat /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root

# For details see man 4 crontabs

# Example of job definition:
# .----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .----- day of month (1 - 31)
# | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# | | | | |
# * * * * * user-name command to be executed

[root@ndbaranov ~]# crontab -l
no crontab for root
[root@ndbaranov ~]# crontab -e
no crontab for root - using an empty one
crontab: installing new crontab
[root@ndbaranov ~]# crontab -e
crontab: no changes made to crontab
[root@ndbaranov ~]# crontab -l
*/1 * * * * logger This message is written from root cron
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# journalctl -g "written"
Sep 08 18:20:01 ndbaranov CROND[6635]: (root) CMD (logger This message is written from root cron)
Sep 08 18:20:01 ndbaranov root[6635]: This message is written from root cron
Sep 08 18:20:01 ndbaranov CROND[6615]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov CROND[6655]: (root) CMD (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov root[6655]: This message is written from root cron
Sep 08 18:21:02 ndbaranov CROND[6637]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov CROND[6680]: (root) CMD (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov root[6680]: This message is written from root cron
Sep 08 18:22:01 ndbaranov CROND[6650]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov CROND[6706]: (root) CMD (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov root[6706]: This message is written from root cron
Sep 08 18:23:01 ndbaranov CROND[6686]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov CROND[6728]: (root) CMD (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov root[6728]: This message is written from root cron
Sep 08 18:24:02 ndbaranov CROND[6708]: (root) CMDEND (logger This message is written from root cron)
[root@ndbaranov ~]#
```

Проверка выполнения в журнале

```
Activities Terminal Sep 8 18:25 en
root@ndbaranov:~

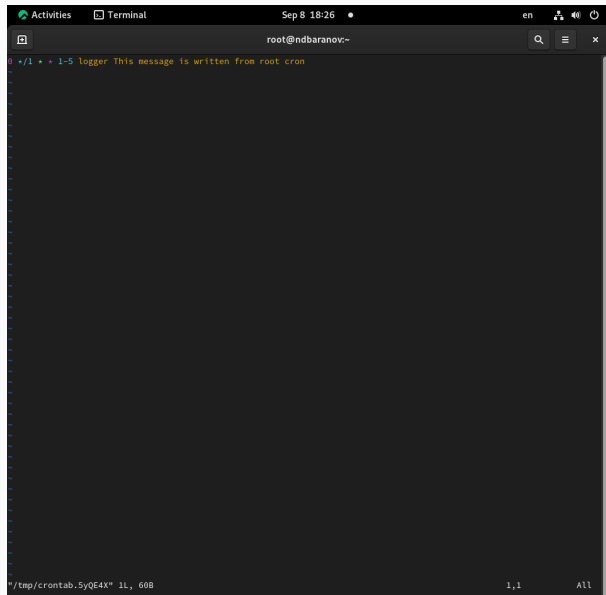
[root@ndbaranov ~]# cat /etc/crontab
SHELL=/bin/bash
PATH=/sbin:/bin:/usr/sbin:/usr/bin
MAILTO=root

# For details see man 4 crontabs

# Example of job definition:
# .----- minute (0 - 59)
# | .----- hour (0 - 23)
# | | .----- day of month (1 - 31)
# | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
# | | | | .----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# | | | | |
# * * * * * user-name command to be executed

[root@ndbaranov ~]# crontab -l
no crontab for root
[root@ndbaranov ~]# crontab -e
no crontab for root - using an empty one
crontab: installing new crontab
[root@ndbaranov ~]# crontab -e
crontab: no changes made to crontab
[root@ndbaranov ~]# crontab -l
*/1 * * * * logger This message is written from root cron
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# journalctl -g "written"
Sep 08 18:20:01 ndbaranov CROND[6635]: (root) CMD (logger This message is written from root cron)
Sep 08 18:20:01 ndbaranov root[6635]: This message is written from root cron
Sep 08 18:20:01 ndbaranov CROND[6615]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov CROND[6655]: (root) CMD (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov root[6655]: This message is written from root cron
Sep 08 18:21:02 ndbaranov CROND[6637]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov CROND[6680]: (root) CMD (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov root[6680]: This message is written from root cron
Sep 08 18:22:01 ndbaranov CROND[6650]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov CROND[6706]: (root) CMD (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov root[6706]: This message is written from root cron
Sep 08 18:23:01 ndbaranov CROND[6686]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov CROND[6728]: (root) CMD (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov root[6728]: This message is written from root cron
Sep 08 18:24:02 ndbaranov CROND[6708]: (root) CMDEND (logger This message is written from root cron)
[root@ndbaranov ~]#
```

Изменение задания в crontab



A terminal window titled "Terminal" with a date and time of "Sep 8 18:26". The prompt is "root@ndbaranov:~". The terminal shows a cron job being edited: "*/1 * * * 1-5 logger This message is written from root cron". The terminal is dark-themed with a light blue border on the left. The status bar at the bottom shows the file path "/tmp/crontab.5yQE4X" with line 1, column 1, and a size of 608 bytes. The status bar also shows "1,1" and "All".

```
root@ndbaranov:~  
*/1 * * * 1-5 logger This message is written from root cron
```

"/tmp/crontab.5yQE4X" 1L, 608 1,1 All

Создание скрипта eachhour

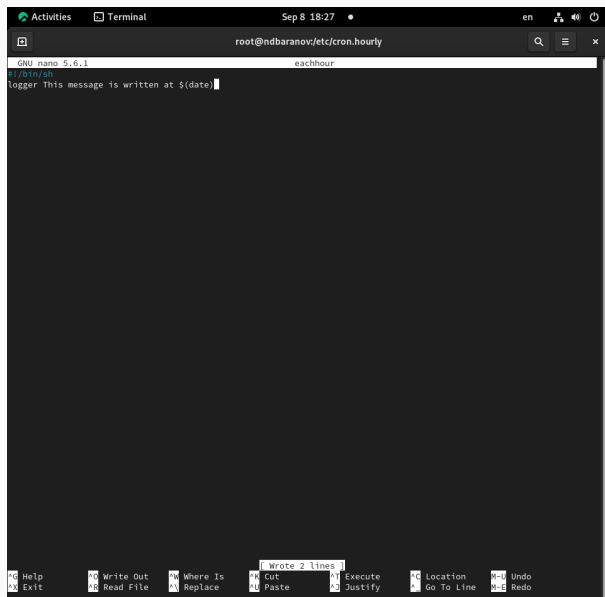
```
Activities Terminal Sep 8 18:27 en
root@ndbaranov:/etc/cron.hourly

# For details see man 4 crontabs

# Example of job definition:
# ----- minute (0 - 59)
# ----- hour (0 - 23)
# ----- day of month (1 - 31)
# ----- month (1 - 12) OR jan,feb,mar,apr ...
# ----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# * * * * * user-name command to be executed

[root@ndbaranov ~]# crontab -l
no crontab for root
[root@ndbaranov ~]# crontab -e
no crontab for root - using an empty one
crontab: installing new crontab
[root@ndbaranov ~]# crontab -e
crontab: no changes made to crontab
[root@ndbaranov ~]# crontab -l
*/1 * * * * logger This message is written from root cron
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# journalctl -g "written"
Sep 08 18:20:01 ndbaranov CROND[6635]: (root) CMD (logger This message is written from root cron)
Sep 08 18:20:01 ndbaranov root[6635]: This message is written from root cron
Sep 08 18:20:01 ndbaranov CROND[6615]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov CROND[6655]: (root) CMD (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov root[6655]: This message is written from root cron
Sep 08 18:21:02 ndbaranov CROND[6637]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov CROND[6680]: (root) CMD (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov root[6680]: This message is written from root cron
Sep 08 18:22:01 ndbaranov CROND[6659]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov CROND[6706]: (root) CMD (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov root[6706]: This message is written from root cron
Sep 08 18:23:01 ndbaranov CROND[6686]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov CROND[6728]: (root) CMD (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov root[6728]: This message is written from root cron
Sep 08 18:24:02 ndbaranov CROND[6708]: (root) CMDEND (logger This message is written from root cron)
[root@ndbaranov ~]# crontab -e
crontab: installing new crontab
[root@ndbaranov ~]# crontab -e
crontab: no changes made to crontab
[root@ndbaranov ~]# crontab -l
0 */1 * * 1-5 logger This message is written from root cron
[root@ndbaranov ~]# cd /etc/cron.hourly
[root@ndbaranov cron.hourly]# touch eachhour
[root@ndbaranov cron.hourly]#
```

Содержимое скрипта eachhour



The screenshot shows a terminal window with the title bar "Activities Terminal" and the date "Sep 8 18:27". The terminal prompt is "root@ndbaranov:/etc/cron.hourly". The file being edited is "eachhour" using "GNU nano 5.6.1". The content of the script is:

```
#!/bin/sh
logger This message is written at $(date)
```

The bottom of the terminal shows the nano editor's status bar with various shortcuts: "G Help", "X Exit", "O Write Out", "R Read File", "W Where Is", "A Replace", "C Cut", "P Paste", "E Execute", "J Justify", "L Location", "G Go To Line", "U Undo", "R Redo". A tooltip "Wrote 2 lines" is visible over the status bar.

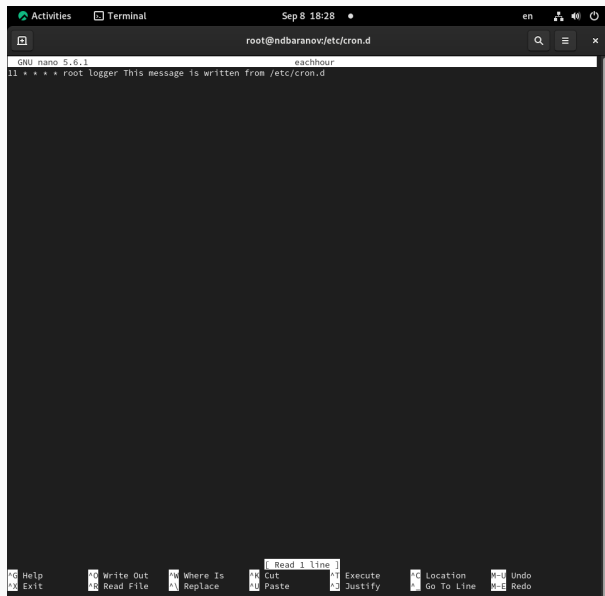
Создание задания в /etc/cron.d

```

# | | |----- day of month (1 - 31)
# | | |   |   |----- month (1 - 12) OR jan,feb,mar,apr ...
# | | |   |   |----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# * * * * * user-name command to be executed

[root@ndbaranov ~]# crontab -l
no crontab for root
[root@ndbaranov ~]# crontab -e
no crontab for root - using an empty one
crontab: installing new crontab
[root@ndbaranov ~]# crontab -e
crontab: no changes made to crontab
[root@ndbaranov ~]# crontab -l
*/1 * * * * logger This message is written from root cron
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# grep written /var/log/messages
[root@ndbaranov ~]# journalctl -g "written"
Sep 08 18:20:01 ndbaranov CROND[6635]: (root) CMD (logger This message is written from root cron)
Sep 08 18:20:01 ndbaranov root[6635]: This message is written from root cron
Sep 08 18:20:01 ndbaranov CROND[6615]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov CROND[6655]: (root) CMD (logger This message is written from root cron)
Sep 08 18:21:02 ndbaranov root[6655]: This message is written from root cron
Sep 08 18:21:02 ndbaranov CROND[6637]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov CROND[6680]: (root) CMD (logger This message is written from root cron)
Sep 08 18:22:01 ndbaranov root[6680]: This message is written from root cron
Sep 08 18:22:01 ndbaranov CROND[6659]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov CROND[6706]: (root) CMD (logger This message is written from root cron)
Sep 08 18:23:01 ndbaranov root[6706]: This message is written from root cron
Sep 08 18:23:01 ndbaranov CROND[6686]: (root) CMDEND (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov CROND[6728]: (root) CMD (logger This message is written from root cron)
Sep 08 18:24:02 ndbaranov root[6728]: This message is written from root cron
Sep 08 18:24:02 ndbaranov CROND[6708]: (root) CMDEND (logger This message is written from root cron)
[root@ndbaranov ~]# crontab -e
crontab: installing new crontab
[root@ndbaranov ~]# crontab -e
crontab: no changes made to crontab
[root@ndbaranov ~]# crontab -l
0 */1 * * 1-5 logger This message is written from root cron
[root@ndbaranov ~]# cd /etc/cron.hourly
[root@ndbaranov ~]# touch eachhour
[root@ndbaranov ~]# nano eachhour
[root@ndbaranov ~]# chmod +x eachhour
[root@ndbaranov ~]# cd /etc/cron.d
[root@ndbaranov ~]# touch eachhour
[root@ndbaranov ~]# nano eachhour
[root@ndbaranov ~]#
```

Содержимое файла в /etc/cron.d



The screenshot shows a terminal window with the nano text editor open. The terminal title bar indicates the user is root@ndbaranov and the current directory is /etc/cron.d. The nano editor's status bar at the top shows 'GNU nano 5.6.1' and the current file is 'eachhour'. The editor's main area contains a single line of text: '11 * * * * root logger This message is written from /etc/cron.d'. The bottom status bar of the nano editor displays various keyboard shortcuts: 'G Help', 'X Exit', 'O Write Out', 'R Read File', 'W Where Is', 'A Replace', 'C Cut', 'P Paste', 'Read 1 line', 'E Execute', 'J Justify', 'L Location', 'G Go To Line', 'U Undo', and 'E Redo'.

```
root@ndbaranov:/etc/cron.d
GNU nano 5.6.1 eachhour
11 * * * * root logger This message is written from /etc/cron.d
```

Help Exit Write Out Read File Where Is Replace Cut Paste Read 1 line Execute Justify Location Go To Line Undo Redo

Проверка статуса atd

The terminal window shows the following sequence of commands and outputs:

```

[baranov@ndbaranov ~]$ su -
Password:
[root@ndbaranov ~]# systemctl status atd
• atd.service - Deferred execution scheduler
   Loaded: loaded (/usr/lib/systemd/system/atd.service; enabled; preset: enabled)
   Active: active (running) since Mon 2025-09-08 17:27:32 MSK; 1h 7min ago
     Docs: man:atd(8)
  Main PID: 1149 (atd)
    Tasks: 1 (limit: 22982)
   Memory: 900.0K
      CPU: 12ms
   CGroup: /system.slice/atd.service
           └─1149 /usr/sbin/atd -f

Sep 08 17:27:32 ndbaranov systemd[1]: Started Deferred execution scheduler.
lines 1-12/12 (END) ...skipping...
• atd.service - Deferred execution scheduler
   Loaded: loaded (/usr/lib/systemd/system/atd.service; enabled; preset: enabled)
   Active: active (running) since Mon 2025-09-08 17:27:32 MSK; 1h 7min ago
     Docs: man:atd(8)
  Main PID: 1149 (atd)
    Tasks: 1 (limit: 22982)
   Memory: 900.0K
      CPU: 12ms
   CGroup: /system.slice/atd.service
           └─1149 /usr/sbin/atd -f

Sep 08 17:27:32 ndbaranov systemd[1]: Started Deferred execution scheduler.

```


Создание задания через at

```
Activities Terminal Sep 8 18:35 en [system icons] [power icon]
root@ndbaranov:~
Docs: man:atd(8)
Main PID: 1149 (atd)
Tasks: 1 (limit: 22982)
Memory: 900.0K
CPU: 12ms
CGroup: /system.slice/atd.service
└─1149 /usr/sbin/atd -f

Sep 08 17:27:32 ndbaranov systemd[1]: Started Deferred execution scheduler.

[root@ndbaranov ~]# at 18:36
warning: commands will be executed using /bin/sh
at> logger message from at
at>
```

Проверка выполнения at

The screenshot shows a terminal window with the following content:

```

Docs: man:atd(8)
Main PID: 1149 (atd)
Tasks: 1 (limit: 22982)
Memory: 900.0K
CPU: 12ms
CGroup: /system.slice/atd.service
└─1149 /usr/sbin/atd -f

Sep 08 17:27:32 ndbaranov systemd[1]: Started Deferred execution scheduler.

[root@ndbaranov ~]# at 18:36
warning: commands will be executed using /bin/sh
at> logger message from at
at>

```

- Получены навыки работы с планировщиком **cron**
- Освоена работа с каталогами `/etc/cron.hourly` и `/etc/cron.d`
- Изучен синтаксис расписаний в `crontab`
- Получены навыки работы с планировщиком **atd**