

MyLast

Emulator al comenziilor
last/lastb

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OBIECTIV

- Reproducerea funcționalității comenziilor standard last și lastb folosind un script Bash pur

Sursa de date

- Sursa de date pentru comenziile custom (*mylast*, *mylastb*) reprezintă jurnalele de sistem localizate în */var/log*
- Aceste jurnale se împart în 5 fișiere, dintre care 2 sunt arhivate în format *.gz*
- Dezinchivarea are loc folosind comanda *less*
- Toate 5 fișiere sunt concatenate într-un string, rezultatul fiind salvat în variabila *file*
- Variabila *file* reprezintă argumentul principal al comenziilor *mylast* și *mylastb*

Directorul /var/log

```
ruslan@ruslan-IdeaPad-Slim-3-16ABR8:/var/log$ ls
alternatives.log          faillog
alternatives.log.1         fontconfig.log
alternatives.log.2.gz     gpu-manager.log
alternatives.log.3.gz     hp
alternatives.log.4.gz     installer
alternatives.log.5.gz     journal
alternatives.log.6.gz     kern.log
apt                         kern.log.1
auth.log                     kern.log.2.gz
auth.log.1                   kern.log.3.gz
auth.log.2.gz                 kern.log.4.gz
auth.log.3.gz                 lastlog
auth.log.4.gz                 lightdm
```

Structura authlog

```
2025-12-17T13:18:02.162297+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[767]: Power key pressed short.
2025-12-17T13:18:05.380083+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[767]: Lid closed.
2025-12-17T13:18:05.785065+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[767]: The system will power off now!
2025-12-17T13:18:05.791144+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[767]: System is powering down.
2025-12-17T20:29:09.941365+02:00 ruslan-IdeaPad-Slim-3-16ABR8 CRON[723]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
2025-12-17T20:29:11.565296+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: New seat seat0.
2025-12-17T20:29:11.575549+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: Watching system buttons on /dev/input/event1 (Power Button)
2025-12-17T20:29:11.587259+02:00 ruslan-IdeaPad-Slim-3-16ABR8 polkitd[761]: Loading rules from directory /etc/polkit-1/rules.d
2025-12-17T20:29:11.588274+02:00 ruslan-IdeaPad-Slim-3-16ABR8 polkitd[761]: Loading rules from directory /usr/share/polkit-1/rules.d
2025-12-17T20:29:11.591474+02:00 ruslan-IdeaPad-Slim-3-16ABR8 polkitd[761]: Finished loading, compiling and executing 14 rules
2025-12-17T20:29:11.593364+02:00 ruslan-IdeaPad-Slim-3-16ABR8 polkitd[761]: Acquired the name org.freedesktop.PolicyKit1 on the system bus
2025-12-17T20:29:11.610764+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: Watching system buttons on /dev/input/event0 (Lid Switch)
2025-12-17T20:29:11.610814+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: Watching system buttons on /dev/input/event2 (AT Translated Set 2 keyboard)
2025-12-17T20:29:13.041388+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: pam_unix(lightdm-greeter:session): session opened for user lightdm(uid=113) by (uid=0)
2025-12-17T20:29:13.075806+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: New session c1 of user lightdm.
2025-12-17T20:29:13.098696+02:00 ruslan-IdeaPad-Slim-3-16ABR8 (systemd): pam_unix(systemd-user:session): session opened for user lightdm(uid=113) by lightdm(uid=0)
2025-12-17T20:29:13.359898+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: gkr-pam: couldn't unlock the login keyring.
2025-12-17T20:29:14.336017+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: pam_succeed_if(lightdm:auth): requirement "user ingroup nopasswdlogin" not met by user "ruslan"
2025-12-17T20:29:48.086335+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: pam_unix(lightdm:auth): authentication failure; logname= uid=0 euid=0 tty=:0 ruser= rhost= user=ruslan
2025-12-17T20:29:50.601678+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: pam_succeed_if(lightdm:auth): requirement "user ingroup nopasswdlogin" not met by user "ruslan"
2025-12-17T20:30:00.209864+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: gkr-pam: unable to locate daemon control file
2025-12-17T20:30:00.210082+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: gkr-pam: stashed password to try later in open session
2025-12-17T20:30:00.222106+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: pam_unix(lightdm:session): session opened for user ruslan(uid=1000) by (uid=0)
2025-12-17T20:30:00.244878+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: New session c2 of user ruslan.
2025-12-17T20:30:00.249759+02:00 ruslan-IdeaPad-Slim-3-16ABR8 systemd-logind[766]: Removed session c1.
2025-12-17T20:30:00.261719+02:00 ruslan-IdeaPad-Slim-3-16ABR8 (systemd): pam_unix(systemd-user:session): session opened for user ruslan(uid=1000) by ruslan(uid=0)
2025-12-17T20:30:00.412005+02:00 ruslan-IdeaPad-Slim-3-16ABR8 lightdm: gkr-pam: unlocked login keyring
2025-12-17T20:30:01.030764+02:00 ruslan-IdeaPad-Slim-3-16ABR8 CRON[1547]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
2025-12-17T20:30:01.032769+02:00 ruslan-IdeaPad-Slim-3-16ABR8 CRON[1547]: pam_unix(cron:session): session closed for user root
2025-12-17T20:30:01.071161+02:00 ruslan-IdeaPad-Slim-3-16ABR8 gnome-keyring-daemon[1315]: The PKCS#11 component was already initialized
2025-12-17T20:30:01.071444+02:00 ruslan-IdeaPad-Slim-3-16ABR8 gnome-keyring-daemon[1555]: discover_other_daemon: 1
2025-12-17T20:30:01.071695+02:00 ruslan-IdeaPad-Slim-3-16ABR8 gnome-keyring-daemon[1315]: The Secret Service was already initialized
2025-12-17T20:30:01.071918+02:00 ruslan-IdeaPad-Slim-3-16ABR8 gnome-keyring-daemon[1556]: discover_other_daemon: 1
2025-12-17T20:30:01.073800+02:00 ruslan-IdeaPad-Slim-3-16ABR8 gnome-keyring-daemon[1557]: discover_other_daemon: 1
```

Argumentul *file*

```
if [ "$1" = "-l" ]; then  
    file=$(less $LOG5) $(less $LOG4) $(less $LOG3) $(cat $LOG2 $LOG1)"  
  
    mylast "$file"  
fi
```

```
if [ "$1" = "-lb" ]; then  
    file=$(less $LOG5) $(less $LOG4) $(less $LOG3) $(cat $LOG2 $LOG1)"  
  
    mylastb "$file"  
fi
```

Emularea last

- Sunt definite variabilele *session* și *queue*
- Session - salvează sesiuni terminate, sesiunile se primesc doar din *queue*
- Queue - salvează sesiuni în curs de desfășurare la momentul citirii liniei
- Comanda *mylast* citește fiecare linie din *authlog* și verifică dacă: 1. A avut loc o autentificare de success a utilizatorului, 2. A avut loc “system power down”, 3. A avut loc o terminare forțată a sesiunii unui utilizator, 4. Utilizatorul s-a delegat din sistem
- Fiecare eveniment din acestea are sintaxa sa specifică în fișierul *authlog*
- Evenimentele de tip 1 adaugă sesiuni în *queue*
- Evenimentele de tip 2, 3, 4 scoat sesiuni din *queue*, adăugându-le în *session*

User login

```
# User sucessful login

if [ "$(echo $line | grep -i "new session")" ]; then

    i=1
    while [ $i -le $(get_len "$line") ]; do
        word=$(echo $line | cut -d " " -f $i)

        if [ "$word" = "user" ]; then
            user=$( echo $line | cut -d " " -f $((i+1)) )
            user=$(echo $user | cut -d "." -f 1)

            nsession=$( echo $line | cut -d " " -f $((i-2)) )

            if [ "$user" != "lightdm" ]; then
                #echo "added $user to the queue"
                queue="$queue $user--$nsession--$(get_date "$line")--$(get_time "$line")"
            fi
        fi

        i=$((i+1))
    done
```

Power down

```
# System power down
if [ "$(echo $line | grep -i "system is powering down")" ]; then
    #echo "sys power down"
    #echo "updating entire queue"

    for user in $queue; do
        duration=$(get_duration "$(echo "$user" | awk -F "-" '{print $4}')" "$(get_time "$line")")

        session="$session \n $user-$(get_time "$line")--($duration)" # TODO
    done
    queue=""
fi
```

User session remove

```
# User session remove

if [ "$(echo $line | grep -i "removed session")" ]; then
    queue_temp=""

    removed=$(echo $line | cut -d " " -f $(get_len "$line"))
    removed="${removed:0:2}"

    #echo "session removed $removed"
    #echo "updating queue"

    for user in $queue; do
        if [ "$removed" = "$(echo $user | cut -d "-" -f 2)" ]; then
            #echo -e "found user: $user to remove..."
            duration=$(get_duration "$(echo "$user" | awk -F "-" '{print $4}')" "$(get_time "$line")")

            session="$session \n $user-$(get_time "$line")--($duration)"
        else
            queue_temp="$queue_temp $user"
        fi
    done
    queue=$queue_temp
fi
```

User logout

```
# Log out

if [ "$(echo $line | grep -i "logged out")" ]; then
    queue_temp=""

    removed=$(echo $line | cut -d " " -f 5)
    removed="${removed:0:2}"

    #echo "session logged out $removed at $(get_time "$line))"
    #echo "updating queue"

    for user in $queue; do
        if [ "$removed" = "$(echo $user | cut -d "-" -f 3)" ]; then
            #echo -e "found user: $user to remove... "
            duration=$(get_duration "$(echo "$user" | awk -F "-" '{print $4}')" "$(get_time "$line")"

            session="$session \n $user-$(get_time "$line")--($duration)"
        else
            queue_temp="$queue_temp $user"
        fi
    done
    queue=$queue_temp
fi
```

Emularea lastb

- Se citește linie cu linie din *file*
- Sunt de interes liniile care denotă eșecul autentificării, după enunțul “password check failed”
- Se adaugă eșecul direct în variabila *session*

Struttura comenzi

```
mylastb() {  
    while read -r line; do  
        if [ "$(echo $line | grep -i "password check failed")" ]; then  
            date="${line:0:10}"  
            time="${line:11:5}"  
  
            user=$(echo "$line" | cut -d "-" -f 3)  
            user=$(echo "$user" | cut -d " " -f 2)  
  
            session="$session \n $user--$date--$time"  
        fi  
    done <<< "$1"  
}
```

Opțiuni de filtrare

-n

Afișează doar n linii din cele mai recente sesiuni

-s

Afișează toate sesiunile după o anumită dată

-t

Afișează toate sesiunile înainte de o anumită dată

-p

Afișează toate sesiunile active la momentul respectiv

Filtrul -n

```
n() {
    session="${session//"\n"/" }"
    i=$(get_len "$session")
    bottom=$((i - $1 + 1))
    while [ $i -ge $bottom ]; do
        log=$(echo $session | cut -d " " -f $i)
        echo -e "${log//"--"/" }"
        i=$((i-1))
    done
}
```

Filtrul -S

```
s() {
    session="${session//"\n"/" "}"

    for line in $session; do
        date=$(echo $line | awk -F "-" '{print $3}')
        time=$(echo $line | awk -F "-" '{print $4}')
        time=$(echo $time | awk -F ":" '{print $1}')
        datetime="$date-$time"
        datetime="${datetime//-.//}"
        datetime="${datetime//:///}"

        cutoff=$1
        cutoff="${cutoff//-.//}"

        if [ $datetime -ge $cutoff ]; then
            echo -e "${line//-.//}" "
        fi
    done
}
```

Filtrul -t

```
t() {
    session="${session//"\n"/"  }"

    for line in $session; do
        date=$(echo $line | awk -F "-" '{print $3}')
        time=$(echo $line | awk -F "-" '{print $4}')
        time=$(echo $time | awk -F ":" '{print $1}')
        datetime="$date-$time"
        datetime="${datetime//-.//}"
        datetime="${datetime//:///}"

        cutoff=$1
        cutoff="${cutoff//-.//}"

        if [ $datetime -le $cutoff ]; then
            echo -e "${line//--//}"
        fi
    done
}
```

Filtrul -p

```
p() {
    session="${session//"\n"/" "}"

    for line in $session; do
        date=$(echo $line | awk -F "-" '{print $3}')

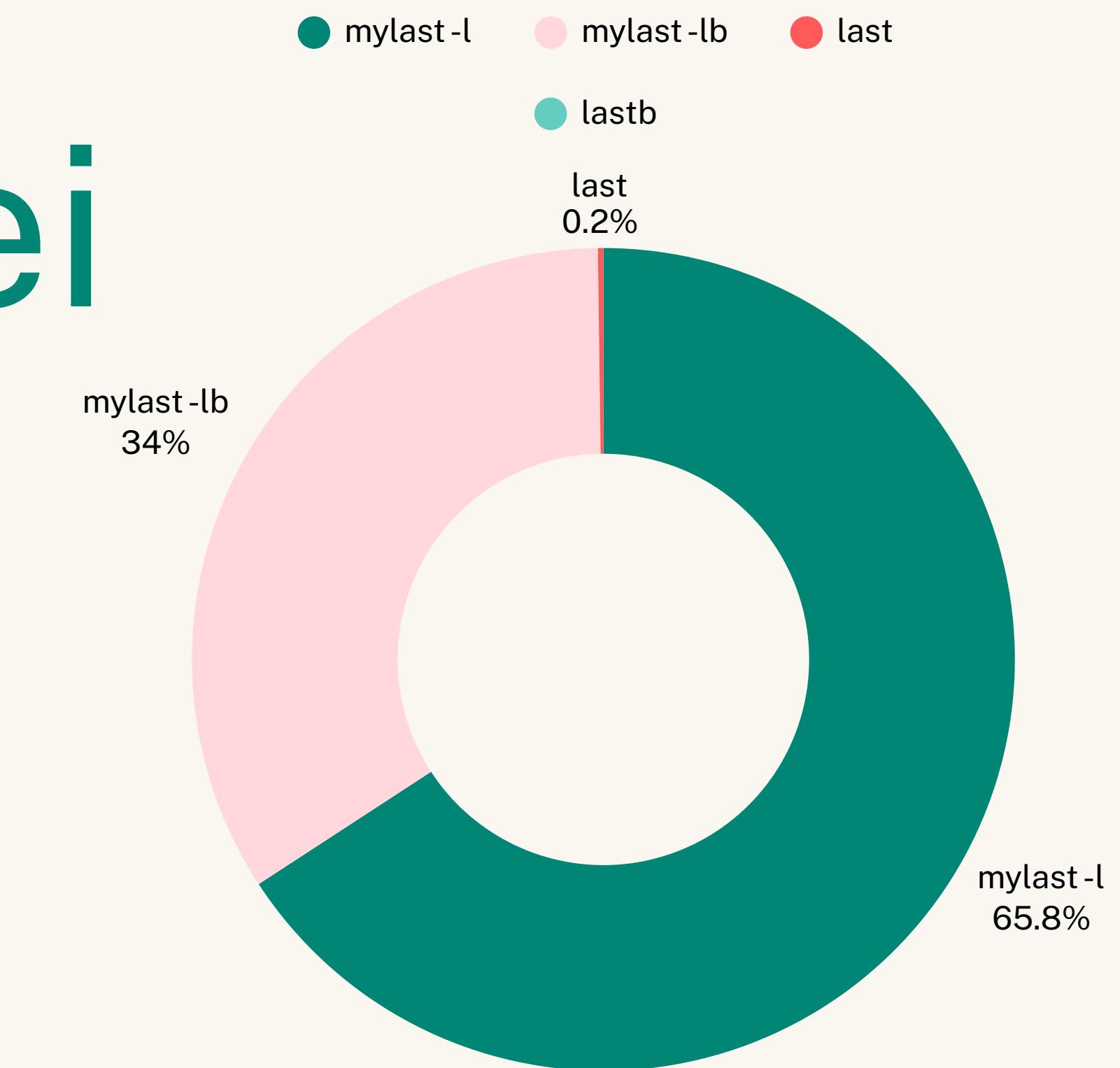
        time=$(echo $line | awk -F "-" '{print $4}')
        time=$(echo $time | awk -F ":" '{print $1}')
        datetime="$date-$time"
        datetime="${datetime//"/""}"
        datetime="${datetime//":/""}"

        present=$1
        present="${present//"/""}"

        endtime=$(echo $line | awk -F "-" '{print $4}')
        endtime=$(echo $endtime | awk -F ":" '{print $2}')
        enddatetime="$date-$endtime"
        enddatetime="${enddatetime//"/""}"
        enddatetime="${enddatetime//":/""}"

        if [ $datetime -le $present ]; then
            if [ $enddatetime -ge $present ]; then
                echo -e "${line//"/""}"
            fi
        fi
    done
}
```

Analiza Performanței



Demo

-l

ruslan	c2	2025-12-14	18:45-22:02	(3:17)
ruslan	c2	2025-12-15	15:22-15:36	(0:14)
ruslan	c2	2025-12-15	16:09-19:21	(3:12)
ruslan	c2	2025-12-16	08:10-11:52	(3:42)
ruslan	c2	2025-12-16	16:49-19:11	(2:22)
ruslan	c2	2025-12-16	21:27-23:18	(1:51)
ruslan	c2	2025-12-17	08:11-13:18	(5:7)
ruslan	c2	2025-12-17	20:30-00:23	(3:53)
ruslan	c2	2025-12-18	08:30-11:31	(3:1)
ruslan	c2	2025-12-18	11:53-13:27	(1:34)
ruslan	c2	2025-12-18	14:46-17:11	(2:25)
ruslan	c2	2025-12-18	20:51	(ongoing)

Demo

-lb

ruslan	2025-12-05	20:31
ruslan	2025-12-05	22:00
ruslan	2025-12-05	22:00
ruslan	2025-12-05	22:00
ruslan	2025-12-06	15:08
ruslan	2025-12-08	20:05
ruslan	2025-12-08	20:35
ruslan	2025-12-09	08:19
ruslan	2025-12-09	10:22

Demo -l -n

```
ruslan@ruslan-IdeaPad-Slim-3-16ABR8:~/Desktop/Projects/mylast$ ./mylast -l -n 4
ruslan  c2  2025-12-18  20:51  (ongoing)
ruslan  c2  2025-12-18  14:46-17:11  (2:25)
ruslan  c2  2025-12-18  11:53-13:27  (1:34)
ruslan  c2  2025-12-18  08:30-11:31  (3:1)
```

Demo -l -S

```
ruslan@ruslan-IdeaPad-Slim-3-16ABR8:~/Desktop/Projects/myLast$ ./myLast -l -s 2025-12-15-15-00
ruslan  c2  2025-12-15  15:22-15:36  (0:14)
ruslan  c2  2025-12-15  16:09-19:21  (3:12)
ruslan  c2  2025-12-16  08:10-11:52  (3:42)
ruslan  c2  2025-12-16  16:49-19:11  (2:22)
ruslan  c2  2025-12-16  21:27-23:18  (1:51)
ruslan  c2  2025-12-17  08:11-13:18  (5:7)
ruslan  c2  2025-12-17  20:30-00:23  (3:53)
ruslan  c2  2025-12-18  08:30-11:31  (3:1)
ruslan  c2  2025-12-18  11:53-13:27  (1:34)
ruslan  c2  2025-12-18  14:46-17:11  (2:25)
ruslan  c2  2025-12-18  20:51  (ongoing)
```

Demo -l -t

```
ruslan c2 2025-12-08 22:56-23:35 (0:39)
ruslan c2 2025-12-09 08:16-11:51 (3:35)
ruslan c2 2025-12-09 21:53-00:56 (3:3)
ruslan c2 2025-12-10 08:26-08:41 (0:15)
ruslan c4 2025-12-10 08:41-13:19 (4:38)
ruslan c2 2025-12-10 18:50-23:12 (4:22)
ruslan c2 2025-12-11 09:30-15:13 (5:43)
ruslan c2 2025-12-11 15:15-15:21 (0:6)
ruslan c2 2025-12-11 21:11-00:20 (3:9)
ruslan c2 2025-12-12 08:39-09:05 (0:26)
ruslan c2 2025-12-12 17:07-18:04 (0:57)
ruslan c2 2025-12-12 20:54-23:31 (2:37)
ruslan c2 2025-12-13 16:19-16:50 (0:31)
ruslan c2 2025-12-13 17:34-22:55 (5:21)
ruslan c2 2025-12-14 10:50-18:27 (7:37)
ruslan c2 2025-12-14 18:45-22:02 (3:17)
```

```
ruslan@ruslan-IdeaPad-Slim-3-16ABR8:~/Desktop/Projects/mylast$ █
```

Demo -l -p

```
ruslan@ruslan-IdeaPad-Slim-3-16ABR8:~/Desktop/Projects/mylast$ ./mylast -l -p 2025-12-14-19-00  
ruslan c2 2025-12-14 18:45-22:02 (3:17)
```

Final