56 - Kommandos später ausführen mit **at** & **batch**

at　　　　Runs a command only once at a predetermined time.

batch　　command is only a script and does the same as **at** except that it executes commands when system load levels permit; in other words, when the load average drops below 0.8

Syntax:
```
at [options] time
batch [options] time
```

How to launch an AT job:
1. Type **at** and any **options** and **time** of execution
2. Enter the command(s) you want to run (press Enter after each command)
    Note: The commands MUST contain the full path of the command.
3. Press Ctrl-D to save the job(s).

- **at options:**
  - `-b`　　　　Run command only when the system load is low
  - `-d` *jobNr* Delete an at job from queue (same as atrm)
  - `-f` *filename*
    　　　　Read job from a specified file
  - `-l`　　　　List all jobs for that user. If user is root, shows all jobs.
  - `-m`　　　　Mails user when job completes.
  - `-q queueName`
    　　　　Send the jobs to a specific queue.
    　　　　Queue names are single letters: **a** to **z** and **A** to **Z**
    　　　　a is the default and set highest AT priority (nice=2).
    　　　　b is the default for batch command queues.
    　　　　The higher the letter the higher the <u>nice</u> value
    　　　　(less priority). <u>nice</u> of: a=2 b=4 c =6 d=8 etc.

- **Time formats**
  - **now**　　　　　　　　　　　Well....NOW!
  - **17:00**　　　　　　　　　　At 17:00 hours
  - **+3 hours**　　　　　　　　In 3 hours from now
  - **+2 minutes**　　　　　　In 2 minutes from now
  - **+2 days**　　　　　　　　Same time as now but In 2 days
  - **+3 months**　　　　　　Same time as now but In 3 months
  - **19:15 12.03.01**　　On 12 march 2001 at 19:15
    　　　　　　　　　　　　　allowed formats:
    　　　　　　　　　　　　　`MMDDYY, MM/DD/YY, DD.MM.YY`
  - **now,noon,teatime (4pm),midnight,today,tomorrow**
  - **4PM**　　　　　　　　　　　At 4 pm today if not too late
    　　　　　　　　　　　　　otherwise tomorrow at 4PM
  - **16:00 + 3 days**　　　At 16:00 hous in 3 days
  - **mon**　　　　　　　　　　　Next Monday same time. Days are:
    　　　　　　　　　　　　　`non,tue,wed,thu,fri,sat,sun`
  - **18:25 31 march 2001**　On <u>march 31 2001</u> at <u>18:25</u>

- **atq**　　　　Show the AT jobs queue of user. Incl jobsNumbers
    　　　　If user is root, shows all jobs. Same as `at -l`

- **atrm** *jobNr [jobNr] ...* Deletes an AT job from the jobs queue
AT Command on one line(useful in scripts)**:**

```
echo "command1;comman2;..." | at time
```

eg.

```
xhost + localhost
echo "xmessage -display :0 'It works'" | at +1 minutes
watch -n1 atq
```

Files involved:

`/var/spool/atjobs`	Where the jobs are stored. **at** Produces jobs starting with a if queue is not given (-q). These jobs is a snapshot of environment variables plus the commands given.
`/var/spool/atspool`	Same as `/var/spool/atjobs`
`/proc/loadavg`	Average system load value that gives a one line display of the following information: The current time, how long the system has been running, how many users are currently logged on, and the system load averages for the past 1, 5, and 15 minutes.
`/var/run/utmp`	Uptime of the processes list in binary format. Used to determine the system load averages.
`/etc/at.allow`	List of users that are allowed to use the commands `batch` and `at`. If present: `/etc/at.deny` is ignored (If at all present) and all the users that are not listed here are NOT allowed.
`/etc/at.deny`	List of users that are NOT allowed to use the command batch and at. If present and `/etc/at.allow` is NOT present, then all users are allowed except the ones listed here.

Alternatives to **at** and **Batch:** consider another batch system like **nqs**.