

Periodic Processes

Commands for batch processing

- Commands `at` and `batch` are used to schedule processes for running once at a specified time
 - In order to use `at`, your name should appear in the file `/usr/lib/cron/at.allow`, or it should not appear in the file `/usr/lib/cron/at.deny`
 - If `at.deny` exists and is empty, global usage is permitted
 - Files contain one user name per line
- The set of utilities under `cron` can be used to schedule processes for invocation more than once, or at regular intervals
 - In order to use `cron`, your name should appear in the file `/etc/cron.d/cron.allow`, or it should not appear in the file `/etc/cron.d/cron.deny`
- `at`
 - Reads commands from stdin and groups them together as an at-job
 - Commands executed in a separate invocation of shell, with no controlling tty
 - Retains the following from the time when `at` is invoked
 - * Environment variables
 - * Current working directory
 - * File creation mask (`umask`)
 - * System resource limits (`ulimit`)
 - The shell may be specified by using the option `-c` (`csh`), `-k` (`ksh`) or `-s` (`sh`)
 - Simple example

```
at 19:00
at> echo "Hello" | mailx sanjiv
at> <EOT>
```
- `batch`
 - Equivalent to the command

```
at -q b -m now
```

 - * Queue `b` is a special `at` queue, specifically for batch jobs
 - Batch jobs are submitted for immediate execution

`cron`: schedule commands

- Used for periodic execution
- Commands are executed by `sh`
- Configuration file `crontab`
 - One file per user, named with login name of the user
 - All `crontab` files stored in the directory `/var/spool/cron/crontabs/`
 - Manipulated by the command `crontab`
- Shell is invoked from `$HOME` with an `arg0` of `sh`

- `.profile` can be executed by explicitly doing so as a part of command string
- Default environment is supplied defining `HOME`, `LOGNAME`, `SHELL=/bin/sh`, `TZ`, and `PATH=/usr/bin`
 - * `PATH` for root cron jobs is `/usr/sbin:/usr/bin`
 - * Default path can be set in `/etc/default/cron`

Crontab format

- Use `#` for comment, at the beginning of line, or at the end of command
- Six fields, separated by spaces or tabs
 1. Minutes (0-59)
 2. Hour (0-23)
 3. Day of month (1-31)
 4. Month of year (1-12)
 5. Day of week (0-6, 0 being Sunday)
 6. Command (string)
 - A percent character is translated as newline character, unless escaped by a backslash
 - Advisable to specify the absolute path of command
- Each of the first five fields can be replaced by an asterisk
- A field can have multiple values, separated by `-` for range or `,` for literals

Crontab management

- Make sure your environment variable `EDITOR` is set to an editor of your choice
- Advisable to modify the crontab file in your directory and submit it using `crontab` command
 - Creates an automatic backup
 - Guards against accidental deletion
- Options `-e`, `-r`, `-l`

Common uses of cron

- Cleaning up files
- Performing backups and distributing files over network
- Rotating logs
- Synchronizing time