Local Services

René Serral-Gracià\textsuperscript{1}

\textsuperscript{1}Universitat Politècnica de Catalunya (UPC)

March 8, 2022
Lectures

1. System administration introduction
2. Operating System installation
3. User management
4. Application management
5. System monitoring
6. Filesystem Maintenance
7. **Local services**
8. Network services
9. Security and Protection
10. Virtualization
Outline

1. Introduction
   - Goals

2. Task Scheduling
Introduction

Task Scheduling

Goals

Knowledge

- Task Scheduling
  - periodic
  - sporadic

- Printing services functionality

Abilities

- Task scheduling configuration
Outline

1. Introduction

2. Task Scheduling
Task Scheduling

Introduction

Task Scheduling

at

atd

/var/spool/cron

batch

crontab

at

cron

R. Serral-Gracià, et. al
Introduction

Task Scheduling

- Periodic command execution
- Per user command file
  - /var/spool/cron/crontab/<user>
- The daemon is executed each minute
  - It checks all the configuration files
  - The file is reread in case it has changed
  - It is not necessary to reload the service in case of changes

The command is executed using user privileges (not superuser)
Task Scheduling: cron

crontab [-l, -r, -e]

- Format for each command line: MM HH DD MM DS command parameters...
  - HH: hour
  - MM: minute
  - DD: day of month
  - MM: month
  - DS: day of the week (Sun, Mon...)

Examples:

<table>
<thead>
<tr>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>* * * * * * &lt;command&gt;...</td>
</tr>
<tr>
<td>33 */2 * * Tue &lt;command&gt;...</td>
</tr>
<tr>
<td>9 0 * 1-7,9-12 1-5 &lt;command&gt;...</td>
</tr>
</tbody>
</table>
at [-f <file>, -q queue] when

- +3 hours, +2 days, 18:00 Apr 3, 5:00pm tomorrow, ...
- 26 queues (a-z) i 26 queues (A-Z)

batch

- When load is not high

- Script from standard input
  - They are stored in /var/spool/cron/atjobs
  - Daemon (atd) executed each minute
    - It verifies all the queues
    - It executes all the required commands
  - It keeps the user privileges and the execution directory
Security considerations

- It might be a security breach
  - A disabled user can continue to execute commands
  - It allows to exceed the maximum CPU time
- Files `/etc/{cron.allow, cron.deny, at.allow, at.deny}`
  - If the .allow files exist, the user must be on it
  - If the .deny files exist, the user cannot be there
- User management
  - Consider inserting disabled users in the .deny files
Exercise

Which tool would you use (and which parameters, input... would you pass to it) for this scheduled tasks

- Daily backup of `/etc`
- Reboot the machine tonight at 2:00
- Weekly rotation of the log files
- Update a database as soon as the machine load is low
- Invalidate a particular user this Friday
- Generate an activity report the first Sunday of each month
Another periodic activities

- Erase old files from `/tmp`
- Check for weak passwords
- Update some system databases (`man`, `locate`, ...)
- Check for software updates
- Service monitoring
Outline

1. Introduction
2. Task Scheduling
Introduction

Task Scheduling

Printing Service

Basic functionality

1. Job sent through HTTP/IPP
2. The job is enqueued
3. The job is post-processed
4. It is printed
CUPS Functionality

- Support for most printers
- Interface using Internet Printing Protocol (IPP)
- Printer self-discovery (local and networked)
- PDF based printing
- ACL based permissions
- Quota
- Printer configuration API
Personal homework

- Network types
  - LAN
  - WAN
- IP Addresses
- Network elements
  - Switch, gateway, router...
- Superserver