



System Fundamentals Coursework

Project

Creating a system from scratch

Version 1.0

Last update: 28/04/2017

Use: Students/Staff

Author: Laurent SANSELME

Conditions d'utilisations : SUPINFO International University vous permet de partager ce document. Vous êtes libre de :

- Partager — reproduire, distribuer et communiquer ce document
- Remixer — modifier ce document

A condition de respecter les règles suivantes :

Indication obligatoire de la paternité — Vous devez obligatoirement préciser l'origine « SUPINFO » du document au début de celui-ci de la même manière qu'indiqué par SUPINFO International University – Notamment en laissant obligatoirement la première et la dernière page du document, mais pas d'une manière qui suggérerait que SUPINFO International University vous soutiennent ou approuvent votre utilisation du document, surtout si vous le modifiez. Dans ce dernier cas, il vous faudra obligatoirement supprimer le texte « SUPINFO Official Document » en tête de page et préciser notamment la page indiquant votre identité et les modifications principales apportées.

En dehors de ces dispositions, aucune autre modification de la première et de la dernière page du document n'est autorisée.

NOTE IMPORTANTE : Ce document est mis à disposition selon le contrat CC-BY-NC-SA Creative Commons disponible en ligne <http://creativecommons.org/licenses> ou par courrier postal à Creative Commons, 171 Second Street, Suite 300, San Francisco, California 94105, USA modifié en ce sens que la première et la dernière page du document ne peuvent être supprimées en cas de reproduction, distribution, communication ou modification. Vous pouvez donc reproduire, remixer, arranger et adapter ce document à des fins non commerciales tant que vous respectez les règles de paternité et que les nouveaux documents sont protégés selon des termes identiques. Les autorisations au-delà du champ de cette licence peuvent être obtenues à support@supinfo.com.

© SUPINFO International University – EDUCINVEST - Rue Ducale, 29 - 1000 Brussels Belgium . www.supinfo.com

SUMMARY

1	GOAL	4
2	PROJECT	4
3	FEATURES	4
1.1	<i>DESKTOP ENVIRONMENT</i>	<i>4</i>
1.2	<i>CUSTOM KERNEL WITH SPLASH SCREEN</i>	<i>4</i>
1.3	<i>SSH.....</i>	<i>5</i>
1.4	<i>CRON</i>	<i>5</i>
1.5	<i>ACL.....</i>	<i>5</i>
1.6	<i>SUDO</i>	<i>5</i>
4	RULES	6
5	CONDITIONS AND DELIVERY	6
6	DEADLINE	6
7	GRADED ITEMS	7

1 GOAL

This project is a research project that will help you improving your overall Linux skills. You will explore course topics beyond the initial in-class course scope.

Your goal is to create a full operating system based on the Cinnamon desktop environment with all its software suite.

During a month, you will learn how to customize entirely your OS and see how a Linux based solution can be a powerful daily alternative to Microsoft Windows or Apple Mac OS.

2 PROJECT

To carry out this project, you will use the Arch Linux distribution (you can also use Gentoo), with the Cinnamon desktop environment. Your solution must be able to run on the following architecture:

- CPU x86
- 1GB RAM
- 1GB Swap
- No hard drive disk limitation. However, if it is extremely small, 1 bonus point may be granted.

3 FEATURES

1.1 DESKTOP ENVIRONMENT

The desktop environment you have to install is Cinnamon. However, to make its use more comfortable, you are going to install all its software suite (Text editor, calculator, virtual terminal, ...)

1.2 CUSTOM KERNEL WITH SPLASH SCREEN

To minimize the time your solution spends on boot, and to add a little customization to your OS, you have to install a second kernel with a splash screen that displays a picture instead of the services' logs. That second kernel must be, at least, of the same version number as the first one but lighter.

You must also have the choice of the kernel you want to boot in when you launch your virtual machine.

If your custom kernel proves to be really optimized, and your OS boots quickly, a bonus point may be granted.

1.3 SSH

To be able to remotely manage your solution, you are going to install an SSH server. To allow your instructor to connect to it, you have to create a new user “supinfo” whom has to be able to connect only by key. The key you have to use is “rsa_key_supinfo.pub” provided with this project.

Finally, you have to forbid every remote connection on the root account whereas it is by password or key authentication.

1.4 CRON

You want to have automatic updates on your system. Those updates must take place from Monday to Friday at 23H59.

You have to keep a log of the information returned in a “update-<date>.log” file and errors returned in a “update-<date>-error.log” file where <date> is the date on which the update took place. Those files must be stored in a “/var/log/autoupdates/” folder.

Making other automation scripts for recursive tasks may lead to 1 extra bonus point.

1.5 ACL

You want different users to be able to use that computer and to share files with them. You have to create:

- An “Alice” user that is also in the “family” group
- A “Baxter” user that is also in the “guest” group
- A “Cooper” user that is also in the “family” group
- A “Django” user that is also in the “star” group

In your default “supinfo” user directory, you will make a folder that only the “family” and “star” groups will be able to read. In that folder there must be a “Alice” text file that only Alice can read and write and a “holidays” text file that only the “family” group can read and write.

1.6 SUDO

The “supinfo” user may have to make administrative tasks on the computer with the sudo command. He has to be able to execute any command in that way.

Users in the family group may have to execute the “date” command with the super-user rights. Moreover, we want them to use it without having to enter a password.

4 RULES

To make this project you can use either one of those Linux distribution:

- Arch Linux
- Gentoo

However, using **installation scripts is forbidden** and will automatically lead in assigning you the “**CHEATER**” grade for this evaluation. In order to verify the details of the installation, you will have to provide screenshots of every step of your configuration or provide a file containing every command you have typed to have a functional solution.

5 CONDITIONS AND DELIVERY

Although you can perfectly do this project on your own if you decide so, this project has been designed to be done by a group of 2-3 students. There is no need to declare your group before the delivery. Will be considered part of the group all students mentioned in the final delivery. All members of the group will get the same mark.

You have to hand back the following to your local trainer:

- A list of the group members with their Campus ID
- MD5 Checksum and list of all your virtual machines hard disks
- Modified configuration files (list + content)
- Screenshots of your installation or list of all the commands that lead to it

You will show your work and do a live demonstration during orals. Your PowerPoint presentation will illustrate technical aspects.

Warning: You're going to send checksums. Be sure they're good and prefer offline tools like md5 (Mac OS), md5sum (Linux) or Summer Properties (Windows) than online websites that can sometime give false hashes (<http://onlinemd5.com/> is a perfect example of what **NOT** to use).

Moreover, once the delivery is done, keep your virtual machine shut as powering it on will modify your checksums.

6 DEADLINE

You must join items from section 5 in a ZIP archive and upload it on the SCE platform before the deadline.

7 GRADED ITEMS

Your grade can't be higher than 20/20 but 4 bonus points may be granted.

Features	Points	Bonus
Extremely small hard drive		1
Cinnamon	5	1
Custom Kernel + Splash screen	4	1
SSH	3	
CRON	4	1
ACL with users	2	
Sudo	2	
Total	20	4