

ADMINISTRACIÓ DE SISTEMES OPERATIUS
November 29th, 2007 (afternoon)

The exam is to be done individually
Answer the questions in the reserved space
Write family name, name (in this order) to the top of this sheet
No books allowed
Max time: 1 hour. (Not allowed to leave the exam before half an hour)

1. (2 points) Cron, and at/batch
A) Explain which is the main difference between the commands 'at' and 'batch'

B) And which is the main difference between 'cron' and 'at'?

C) Which are the minimum and maximum frequencies of 'cron' and 'at'?
Cron:

At:

2. (2 points) Permissions and ACL's
Criticize the permission mechanism in standard UNIX, and explain how ACLs can help us, as administrators

3. (1 point) Vmstat

Analyze the following output from the 'vmstat' command:

```
# vmstat -n 30
procs -----memory----- ---swap-- -----io----- -system-- -----cpu-----
 r  b   swpd   free   buff  cache   si   so   bi   bo   in   cs  us  sy  id  wa
 0  0     0 101872 26752 40116   0   0    3    2 252  16  0  0 99  0
 1  0     0  85456 26752 40116   0   0    2    0 254  20  0  2 97  0
 1  0     0  64996 26752 40116   0   0    0    0 253  17  0  3 97  0
 1  0     0  44476 26752 40116   0   0    0    1 254  20  0  2 97  0
 1  0     0  23956 26752 40116   0   0    0    0 253  17  0  3 97  0
 0  0     0 100605 26752 40116   0   0    3    2 252  16  0  0 99  0
```

- What do you think it has happened to this machine during the last minutes?

- Would you take any action as a response? Why?

4. (2 points) Users and permissions

In a system, we have the following information:

```
$cat /etc/passwd
...
ampp01:$1$rU0/d6qF$WXVzHi2ibdWL/:20005:100:::/home/courses/ampp/ampp01:/bin/false
ampp02:$1$rU0/d6qF$hdhezHi2ibdWL/:20006:100:::/home/courses/ampp/ampp02:/bin/bash
ampp10:*$1$t1MP69Mo$jdsfedsH:20014:100:::/home/courses/ampp/ampp10:/bin/bash
ampp03:$1$t1Myfhkio$4V3jjjhgY:20015:102:::/home/courses/ampp/ampp03:/bin/csh
ampp04:$1$t1MokjgMo$4V3krudRl:20016:100:::/home/courses/ampp/ampp04:/bin/sh
...
$cat /etc/groups
users:100:
sh:102:ampp10
$ls -la /home/
drwxr-xr-x 42 root root 4096 2007-11-13 17:14 .
drwxr-xr-x 42 root root 4096 2007-11-13 17:14 ..
drwxr-xr-- 42 root sh 4096 2007-11-13 17:14 shared
-rwxrwxr-- 9 ampp02 sh 4096 2007-11-07 16:19 users.txt
$ls -la /home/shared
drwxr-xr-- 42 root sh 4096 2007-11-13 17:14 .
drwxr-xr-x 42 root root 4096 2007-11-13 17:14 ..
-rwxr-xr-- 42 ampp01 sh 4096 2007-11-13 12:10 list
-rwxr-xr-- 9 ampp10 sh 4096 2006-11-07 13:24 list.bak
-rwxr-xr-- 9 ampp03 sh 4096 2006-11-07 13:24 others
```

Answer the following questions:

- Which users are currently disabled?
- Which users can read the contents of the file '/home/shared/list'?
- Which files can be modified by user 'ampp10'?
- Which users can delete the file '/home/users.txt'?

5. (3 points) Backups

A) Build the backup policy (type of backup, device, frequency, ...) of a Web Server, where:

- There are 100 clients with 0.5 GB of data each
- In case of a failure, we want to be able to restore the last version of the Web pages as soon as possible

B) Assume that instead of a single machine, we have to maintain 10 servers. How do you think this will change the backup policy?