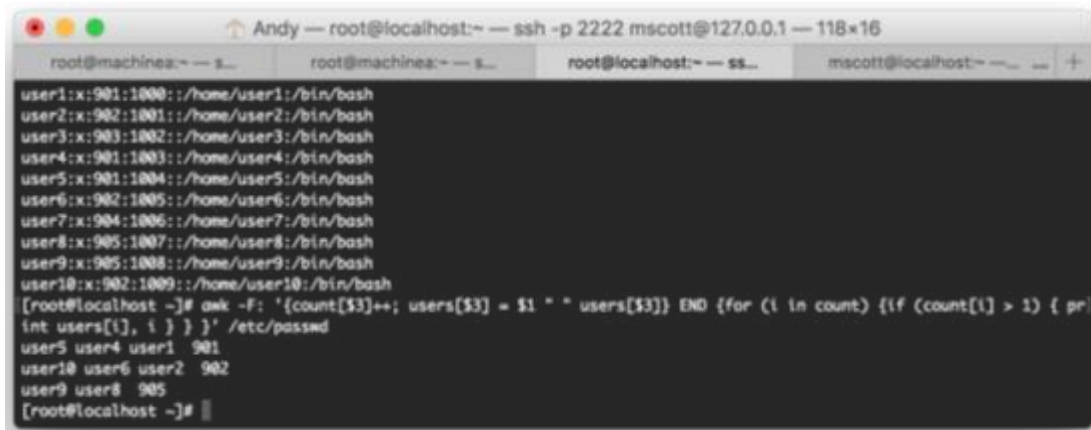


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CSCI 4113
Homework 5

1. `awk -F: '{count[$3]++; users[$3] = $1 " " users[$3]} END {for (i in count) {if (count[i] > 1) { print users[i], i } } }' /etc/passwd`



A terminal window titled 'Andy' showing the output of an awk command. The command is: `awk -F: '{count[$3]++; users[$3] = $1 " " users[$3]} END {for (i in count) {if (count[i] > 1) { print users[i], i } } }' /etc/passwd`. The output lists users with duplicate home directories: `user5 user4 user1 901`, `user10 user6 user2 902`, and `user9 user8 905`. The terminal also shows the initial list of users and their home directories before the command is executed.

```
user1:x:901:1000::/home/user1:/bin/bash
user2:x:902:1001::/home/user2:/bin/bash
user3:x:903:1002::/home/user3:/bin/bash
user4:x:901:1003::/home/user4:/bin/bash
user5:x:901:1004::/home/user5:/bin/bash
user6:x:902:1005::/home/user6:/bin/bash
user7:x:904:1006::/home/user7:/bin/bash
user8:x:905:1007::/home/user8:/bin/bash
user9:x:905:1008::/home/user9:/bin/bash
user10:x:902:1009::/home/user10:/bin/bash
[root@localhost ~]# awk -F: '{count[$3]++; users[$3] = $1 " " users[$3]} END {for (i in count) {if (count[i] > 1) { print users[i], i } } }' /etc/passwd
user5 user4 user1 901
user10 user6 user2 902
user9 user8 905
[root@localhost ~]#
```

2. How was the TCP/IP protocol determined to be modeled in four layers? Could the four layers be broken up into a more distributed model or would that be counterproductive/ineffective?
3. Proc is a virtual filesystem. It doesn't actually contain any real files but instead runtime system information. Many system utilities are just calls to files in /proc. If you change files in /proc you can read or change kernel parameters while the system is still running. /proc resides on system memory, not the disk.
4. /proc/devices gives you a list of devices that are configured for the current kernel, broken into block devices and character devices.