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CSCI 344

24 January 2023

Step 2: Log into your account

Step 4: Unix Environment

a & b: Once you log into your account, let's start by displaying all your environment variables by typing the *env* command

```
ltsmith@ip-172-31-43-34:~$ env
XDG_SESSION_ID=654
TERM=xterm-256color
SHELL=/bin/bash
SSH_CLIENT=73.220.194.203 50909 22
SSH_TTY=/dev/pts/2
USER=ltsmith
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33;01:cd=40;33;01:or=40;31;01:mi=00:su=37;41:s
g=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha
=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.Z=
01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=01;31:*.lzo=01;31:*.xz=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01
;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=0
1;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.jpg=01;35:*.jpeg=01;35:*.gif=01;35:*.bmp=01;35:*.pbm
=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.
svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.m2v=01;35:*.mkv=01;35:*.webm=01;35:*.ogm=01;
35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt=01;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rm=01;35:*.rmvb=0
1;35:*.flc=01;35:*.avi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=0
1;35:*.emf=01;35:*.ogv=01;35:*.ogx=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi=00;36:*.mk
a=00;36:*.mp3=00;36:*.mpc=00;36:*.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00;36:*.opus=00;36:*.spx=00;36:*.xspf=00;36:
MAIL=/var/mail/ltsmith
PATH=/home/ltsmith/bin:/home/ltsmith/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/game
s:/usr/local/games:/snap/bin
PWD=/home/ltsmith
LANG=en_US.UTF-8
SHLVL=1
HOME=/home/ltsmith
LC_TERMINAL_VERSION=3.4.19
LOGNAME=ltsmith
XDG_DATA_DIRS=/usr/local/share:/usr/share:/var/lib/snapd/desktop
SSH_CONNECTION=73.220.194.203 50909 172.31.43.34 22
LESSOPEN=| /usr/bin/lesspipe %s
XDG_RUNTIME_DIR=/run/user/1052
LC_TERMINAL=iTerm2
LESSCLOSE=/usr/bin/lesspipe %s %s
_=/usr/bin/env
ltsmith@ip-172-31-43-34:~$ echo $HOME
/home/ltsmith
```

c. From the output above, what is the first character? The first character is ‘/’, which is the Linux root directory.

d.

```
ltsmith@ip-172-31-43-34:~$ mkdir $HOME/dir1 $HOME/dir2
ltsmith@ip-172-31-43-34:~$ mkdir -p $HOME/dir1/dir3
```

e.

```
ltsmith@ip-172-31-43-34:~$ cd dir2
ltsmith@ip-172-31-43-34:~/dir2$ mkdir dir4
ltsmith@ip-172-31-43-34:~/dir2$ cd ../dir1/dir3
ltsmith@ip-172-31-43-34:~/dir1/dir3$ mkdir dir5
```

f. What is the difference between a full and relative path name? A full path name includes the entire directory location down to the root directory (i.e. /home/liamsmith/dir4/) and a relative path only includes the usually more “user friendly view” (i.e. ~/dir4).

g. Use the ***touch*** command to create an empty file named *myfile* and then use the ***ls -l*** command to display the file's metadata.

```
ltsmith@ip-172-31-43-34:~/dir1/dir3$ touch file.txt
ltsmith@ip-172-31-43-34:~/dir1/dir3$ ls -l
total 4
drwxrwxr-x 2 ltsmith ltsmith 4096 Jan 23 20:43 dir5
-rw-rw-r-- 1 ltsmith ltsmith    0 Jan 23 20:44 file.txt
```

i. Display the contents of the environment **PATH** variable as: $ echo $PATH

```
ltsmith@ip-172-31-43-34:~$ echo $PATH
/home/ltsmith/bin:/home/ltsmith/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/us
r/local/games:/snap/bin
```

j. What does it contain? It contains the locations of shell command executable binaries in hierarchical order.

k. Use the *whereis* command to locate where the *ls* executable resides.

```
ltsmith@ip-172-31-43-34:~$ whereis ls
ls: /bin/ls /usr/share/man/man1/ls.1.gz
```

l. Within your current shell environment, temporary change the contents of the PATH variable by deleting the directory where *ls* resides.

```
ltsmith@ip-172-31-43-34:~$ export PATH=/home/ltsmith/bin:/home/ltsmith/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/
sbin:/usr/bin:/sbin:/usr/games:/usr/local/games:/snap/bin
```

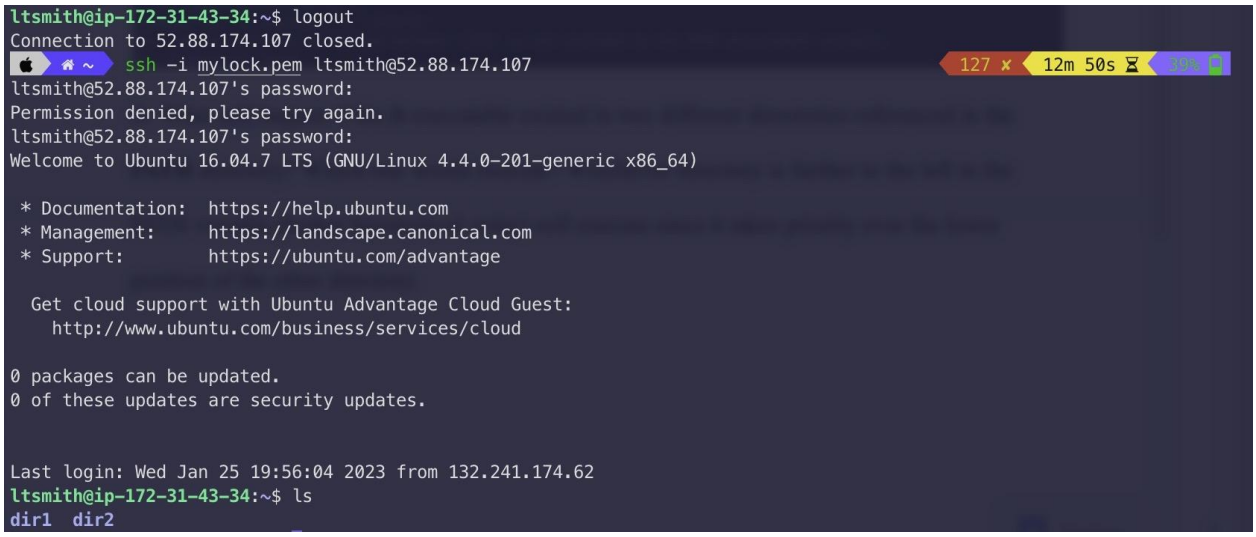
m. Can you explain how the ***export*** command works? The export command allows local shell variables that are created/altered to persist (so long as they aren't reset in the initialization profile) when the shell is killed and expands the scope of the variable to other shells as well.

n. Try the ***ls*** command and notice that its execution will fail.

```
ltsmith@ip-172-31-43-34:~$ ls
Command 'ls' is available in '/bin/ls'
The command could not be located because '/bin' is not included in the PATH environment variable.
ls: command not found
```

O. What will happen if the ***ls*** executable existed in two different directories referenced in the **PATH** directory? Which one would execute? Whichever directory is further to the left in the PATH variable (higher hierarchical order) will execute since it takes priority over the lower position of the other directory.

P. Since the contents of the PATH environment got fouled up with the earlier export command, let's reset it by logging out from the UNIX server and logging back in. This will cause your initialization profile script to re-execute and hence, to reset the contents of the PATH variable.

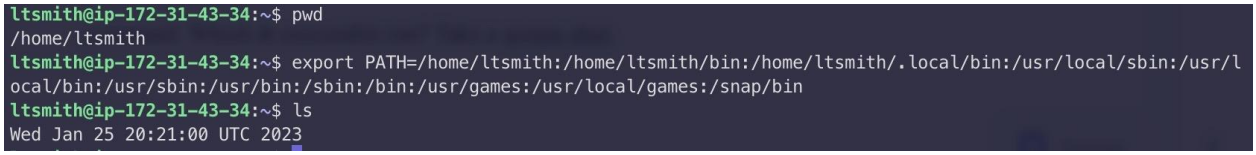


Q. Create a dummy Bash script named ***ls*** which simply displays the current date and save it in your **HOME** directory.

R. Convert the ***ls*** file created in the previous step into an executable with the following command: $ **chmod 700 ls**

S. Can you explain how the ***chmod*** command works? *Chmod* stands for ‘change mode’ and allows users and super users to modify the file permissions for any given file, and the numbers that follow chmod are permission codes for read, write, and execute permissions respectively.

T. Next, add your **HOME** directory to the first slot in the **PATH** variable and try running the ***ls*** command. Which ***ls*** executable ran? Take a screen shot.



The **ls** executable we just created executed instead of the normal ls command because we put it it front of the /bin directory on our PATH.

U. Next, move your **HOME** directory from the first slot of the **PATH** variable to the last slot. Which ***ls*** executable ran?

The default ls command executed since its directory came before my home directory on PATH.

Step 5: More Unix

Bash Script:

```
#!/bin/bash
touch myfile.txt
> myfile.txt # Clearing file contents if it already exists
for i in {1..1000}
do
    echo $i >> myfile.txt # populating file with values
done

# Splitting file
head -n 200 myfile.txt > f1.txt
head -n 400 myfile.txt | tail -200 > f2.txt
head -n 600 myfile.txt | tail -200 > f3.txt
head -n 800 myfile.txt | tail -200 > f4.txt
head -n 1000 myfile.txt | tail -200 > f5.txt
> myfile.txt # clear file to allow for repopulation without the middle chunk
# repopulating...
cat f1.txt >> myfile.txt
cat f2.txt >> myfile.txt
cat f4.txt >> myfile.txt
cat f5.txt >> myfile.txt
```

Step 6: File Transfer

```
~ sftp -i mylock.pem ltsmith@52.88.174.107                                  5.7s  96%
ltsmith@52.88.174.107's password:
Connected to 52.88.174.107.
sftp> pwd
Remote working directory: /home/ltsmith
sftp> ls
dir1                    dir2                    f1.txt                  f2.txt                  f3.txt
f4.txt                  f5.txt                  file.sh                 ls                      myfile.txt
myfileTransfered.txt
sftp> get myfileTransfered.txt
\Fetching /home/ltsmith/myfileTransfered.txt to myfileTransfered.txt
myfileTransfered.txt                                                    100% 3093    50.9KB/s   00:00
```

```
sftp> put vimrc_removed.txt
Uploading vimrc_removed.txt to /home/ltsmith/vimrc_removed.txt
vimrc_removed.txt                                                       100%  200     6.5KB/s   00:00
sftp>
```