

MODULE 2: System Environment and File System

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1 Introduction

The system environment is the environment in which multiple users can live simultaneously. In order for these users not to interfere with each others business, they each live in their own Environments. These users have their own environment variables, which can be altered for the lifetime of the current shell. These variables control vertain aspects of the shell, i.e the PATH, the default EDITOR, which USER is logged in, and other necessties that the system uses to determin the state of the user. The PATH variable for example contains all the directories in which the shell searches for binaries. This allows the user to be able to run for example 'mozilla', in stead or directing the shell to it's absolute location /usr/bin/mozilla. Although the user has it's own shell s/he is still logged on to the same filesystem as everybody else. A common Linux filesystem includes these folders

bin–system binary files (accisible to non-root users)
boot–boot files, including the boot loader
dev–device inodes
etc–configuration files
home–home directories
lib–common libraries
mnt–mounted file systems
proc–process information
root–root's home directory
sbin–system binary files (not accisible to non-root users)
sys–kernel information about devices
tmp–temporary space
usr–user accessible programs
var–various information, including logs and mail

There are many ways of searching the file system tree. Here are short descriptions of usefull searching commands.

- find: search the file tree as is.
- locate: search a created database of the file tree, depends on
- updatedb to be run to update the database.
- which: search the \$PATH variable for a binary

2 Permissions

Every file and directory has permissions associated with it. There are premissions for the owner, the group, and everybody else. The owner of the file can change the permissions for that file. A standard

permission will look like this “-rwxr-xr-x” the first - denotes the type of the file. Command values are - for a file, d for a directory and l for a link. The next three - are the owners permissions r means 'read' w means 'write' and x means 'execute'. in the above case the file's owner can read, write and execute the file, everybody else in the owners group can read and and execute the file, but not write to it, and so can everybody else. To change permissions one can use the **chmod** command. To give write access to everybody you would do 'chmod a+w file' to remove all execute permissions for others you would run 'chmod o-x file'.

3 References

http://www.comptechdoc.org/os/linux/usersguide/linux_ugenvironment.html

<http://www.lysator.liu.se/~forsberg/linux/environment-variables.html>

<http://www.geocities.com/tipsforlinux/articles/030.html>

http://www.dsl.org/cookbook/cookbook_10.html

<http://www.zzee.com/solutions/linux-permissions.shtml>

<http://www.bembry.org/tech/linux/permissions.php>

4 Things to Learn

- How to navigate better through the file system
- Learn where important files and directories are located
- How to change your environment variables

5 Things to Do

- Read .bashrc and .bash_profile and understand what they do
- Search for files of which you know the location and confirm it.
- Learn what all environment variables do, and how you can use them
- Create a file, and change it's permissions.

6 Show and Tell

- Add a bin directory to your home directory, and add it to your path.
- What can you do now you have a bin directory in your homedirectory?
- Find where the 'find' binary is located
- Search for all hidden (dotted) files in your homedirectory
- Find all files in your homedirectory larger than 50K
- Show all environment variables

- Explain how to change an environment variable so it can be accessed everytime you log on.
- What's the difference between `.bashrc` and `.bash_profile`
- Create a file that is readable by no one other than the creator of the file.
- Create a directory that is accessible to every user on the system.

7 Feedback

Please use the space below for feedback on this program, and in particular this module.