

NSS Assignment - 0

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Assignment consist of a rudimentary shell that allows multiple users to login simultaneously. I created a rudimentary filesystem which has 'simple_slash' as root directory then 'simple_home'. Which contains all user space folders, defined as u1, u2, u3...and so on. Each user has a username and a group. Each file/directory in the system has a username and group.

Commands implemented - fput, fget, cd, ls and create_dir

- Each file in the system has a owner and a group.
- A user present in the group can read the content of the file/directory.
- Owner can read and write to the directory/file.
- Each user can be part of multiple groups.
- Each file/directory in the system will have one owner and one group.
- Simple_home directory has no owner and group, so everyone have full access of those directory. Whereas a user can access other user files based on their permissions.

User Manual

ls <directory/empty>

fput <filename/relative_path/absolute_path> <Space separated string>

 If file created then

 system will ask for owner and group of file.

 Else

 enter '.' to get inherit parent directory permissions for the file.

fget <filename/relative_path/absolute_path>

create_dir <directory_name/relative_path/absolute_path>

cd <../relative_path/absolute_path>

Features of the System

- Brute force prevention for login
- No user can go back backward from root directory. (root = simple_slash, cd ..)
- A user cannot change directory to any other user (user can only cd to directory if user is part of group or owner of that directory).
- Proper checks are implemented for input validation
- Check on various places for non existing content, which can lead to server crash.
- Check for unknown command.
- System produces canonicalized absolute pathname for resolving queries.
- One session per user
- Cannot overwrite an existing directory

Assumptions

- User will not enter multiple non existing directory for create_dir command.
- System doesn't need to predefine file permission. My system check/calculate permission of each user for every request made in the system.
- 5 users are enough for trial of the rudimentary shell.
- File permission or database doesn't need to be stored together with the file. Database can be present on the different directory.
- For inheriting parent directory permissions, user need to enter '-' for confirmation of inheritance.
- Only one string will be entered for fput command with 1024 character is upper limit.
- User can cd to any directory if user is owner or part of group.

Test Input

- Defended against unauthorized access
Currently logged in via u1
 - Ls ../u2
 - Ls ../../u1/../u2
- Defend against unauthorized destination writting
Fput ../myfile.txt random string etc
- Similar for Fget, ls
- Directory present in the path myFolder
Create_dir myFolder
Won't create a folder