CSCI 211
UNIX Lab

Basic Unix Commands (1)

Dr. Jiang Li

Today's Focus

- System login
- Directories and files
- Basic commands (directory and file related)
  - *id, passwd*
  - *ls, chmod*
  - *man*
  - *cd, pwd*

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Logging in

- Connecting to a remote machine:
  - We'll connect to the Linux Server via SSH (available in putty)
  - The server's address is 138.238.148.14
  - After connection, you are presented with a *login prompt*
  - Input your username and password to login
  - After logging in, you're placed in your home directory (where your personal files are located)

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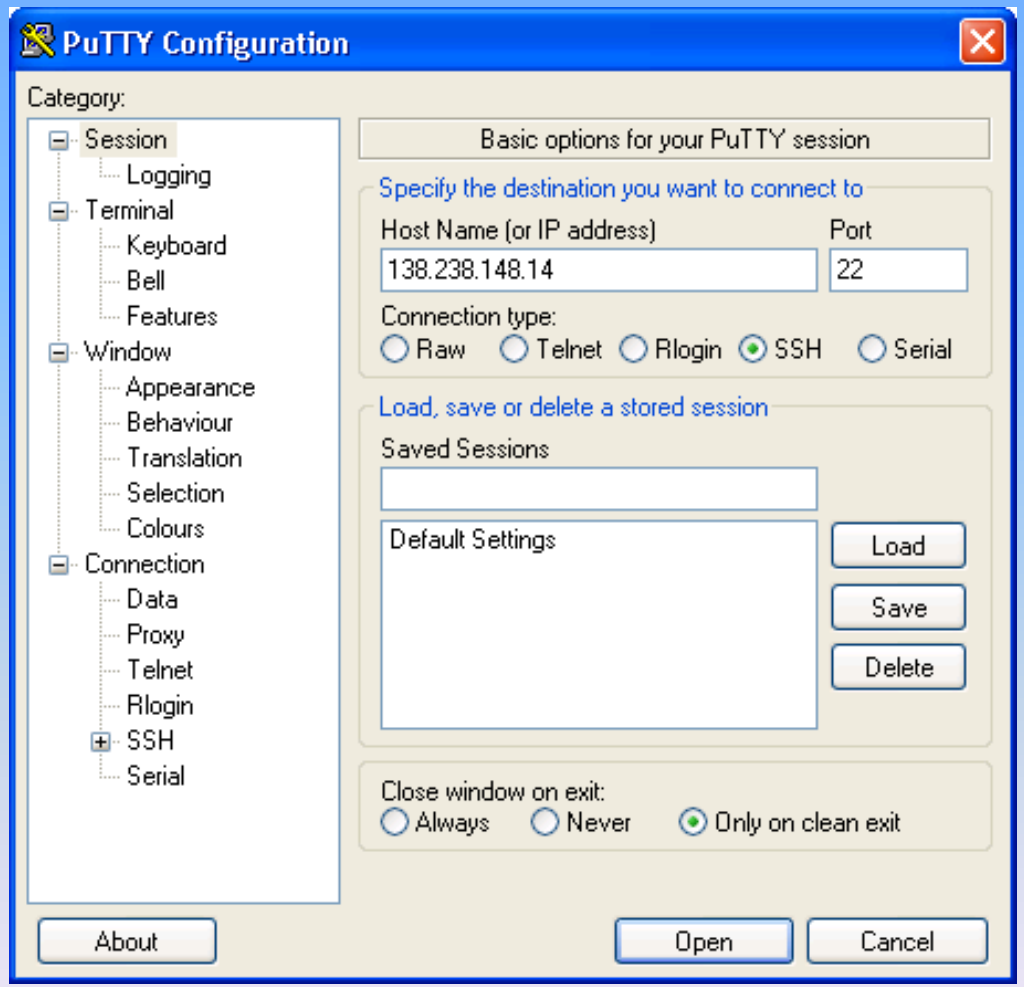
Putty Connection Interface

- Input the server's address in '*Host Name*' text box
- Choose *SSH* as the connection type
- Use the default port number 22
- Click 'Open' button to connect to the server



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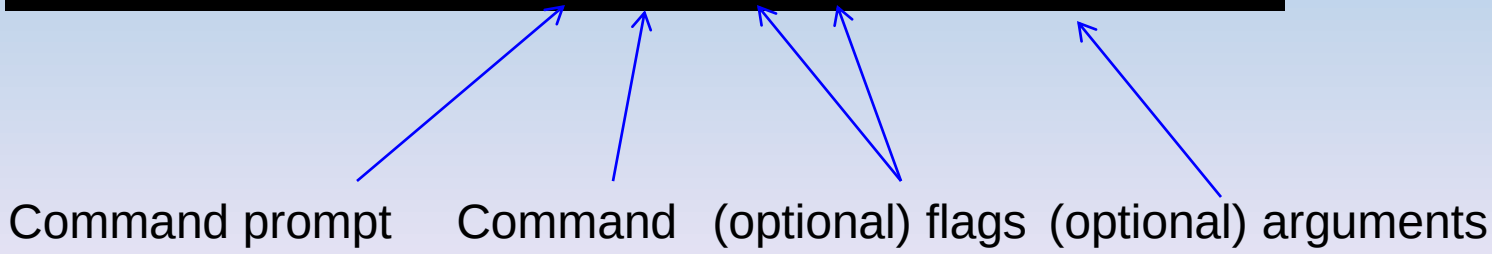
The Command Prompt

- After you login, you will see the command prompt at beginning of each line
- You can type your commands after the *command prompt*
- A command consists of a command **name and some option(s) called flag(s)**
- In Unix and Linux, *everything (including commands) is* ***case-sensitive****.*

```
[prompt]$ <command> <flags> <args>
```

```
username@hostname:~$ ls -l -a unix-tutorial
```



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`id` Command

- ***Users and Groups***
  - Linux is a multi-user/group system
  - Each user belongs to one or more groups
  - Each group contains one or more users
- `id`
  - Get the information of the login account
    - User's id, username, group id and group's names that the user belongs to
  - Example

```
[prompt] $ id
uid=51931(hguo) gid=14082(cgroup761)
groups=14082(cchome761),16207(admin_nonprod),16210(admin_
prod)
```

Setting a Password

- `passwd` command
  - You can use `passwd` to change/setting a password for your account
  - You need to input your old password for authentication, then input your new password two times
  - Example

```
[prompt] $ passwd
Changing password for hguo.
Enter login(LDAP) password:
New password:
Re-enter new password:
```

Directories

- In Unix, files are grouped together in places called *directories*, which are analogous to *folders* in Windows
- Directory paths are separated by a forward slash: /
  - Example: */home/scs/howard*
- The hierarchical structure of directories (the directory tree) begins at a special directory called the *root, or /*
  - *Absolute paths start at /*
    - Example: */home/robh/classes/sycs211*
  - *Relative paths* start in the current directory
    - Example: *classes/sycs211* (if you're currently in /home/robh)
- Your home directory "~" is where your personal files are located, and where you start when you log in.
  - Example: */home/yourusername*

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Directories (cont'd)

- Following symbols have special meanings you need to know
  - ~ : Your home directory
  - .. : The parent directory
  - . : The current directory

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Files

- File is a logical unit used to store user's and/or system data
- Ultimately, Linux is a collection of files stored on the hard disk
- Filename
  - Unix filenames are much like the filenames on other OS.
  - But unlike Windows, Unix file types (e.g. "executable files, " "data files," "text files") are *not determined by file extension (e.g. "foo.exe", "foo.dat", "foo.txt")*
- Many file-manipulation commands use only 2 letters
  - e.g., *ls, cd, cp, mv, rm, nl*, etc.

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List the Content

- `ls` command
  - One of the most frequently used command
  - *LiSts* the contents (and their attributes) in a specified directory (or the current directory if no arguments are specified)
  - Syntax: `ls [<args> … ]`
  - Example: `ls backups/`
    - List the contents in '*backups*' directory

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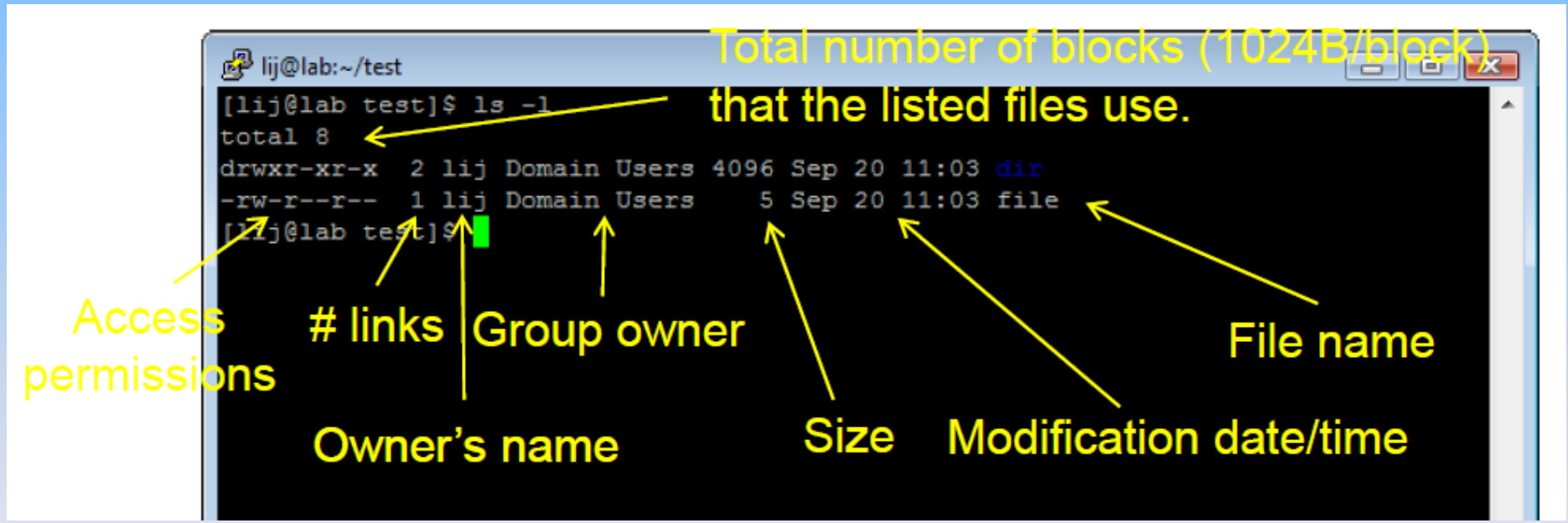
The `ls` Command with `-l`

- `ls -l`
  - This command gives more information about the files present in the current directory.



Notes on access permissions

- Example: (a) `drwxrwxr--`

  (b) `-rwxr-x---`
- First character: directory (d) or file (-).
- Then, 3 groups of 3 letters (total 9 letters)
  - Owner's permission, Group member's, Others'
- Within each group
  - Readable (r) / Writable (w) / Executable (x)
  - No permission is represented by a dash (-)

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Notes on access permissions

- Example
  - `-rwxrwxrwx`
    - Everybody can read, write and execute the file
    - Lowest security, highest accessibility
  - `-rw-------`
    - Only the owner can read and write the file
    - Highest security, lowest accessibility

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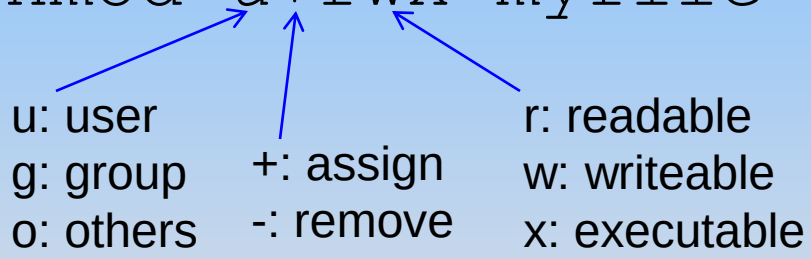
`chmod` - Modify Permissions

- Syntax:

  `chmod [OPTION] mode FILE/DIR`

- Examples:
  - `chmod u+rwx myfile`



- `chmod go-w mydir`
  - Remove write permission on group&others for *mydir* directory

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The `ls` Command with `-a`

- `ls -a`
  - Using (`-a`) flag shows **all** files/sub-directories, including visible files and invisible files
  - Invisible file's filename start with *dot sign*
    - e.g.: *.profile*, *.bashrc*, ., ..

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Getting help with man

- `man` (short for "manual") documents for commands
  - `man <cmd>` retrieves detailed information about <cmd>
  - `man -k <keyword>` searches the short descriptions and manual pages for `keyword` (faster, and will probably give better results)

```
fiji:~$ man -k password
Passwd          (5) - password file
xlock           (1) - Locks the local X display
                      until a password is entered
fiji:~$ passwd
```


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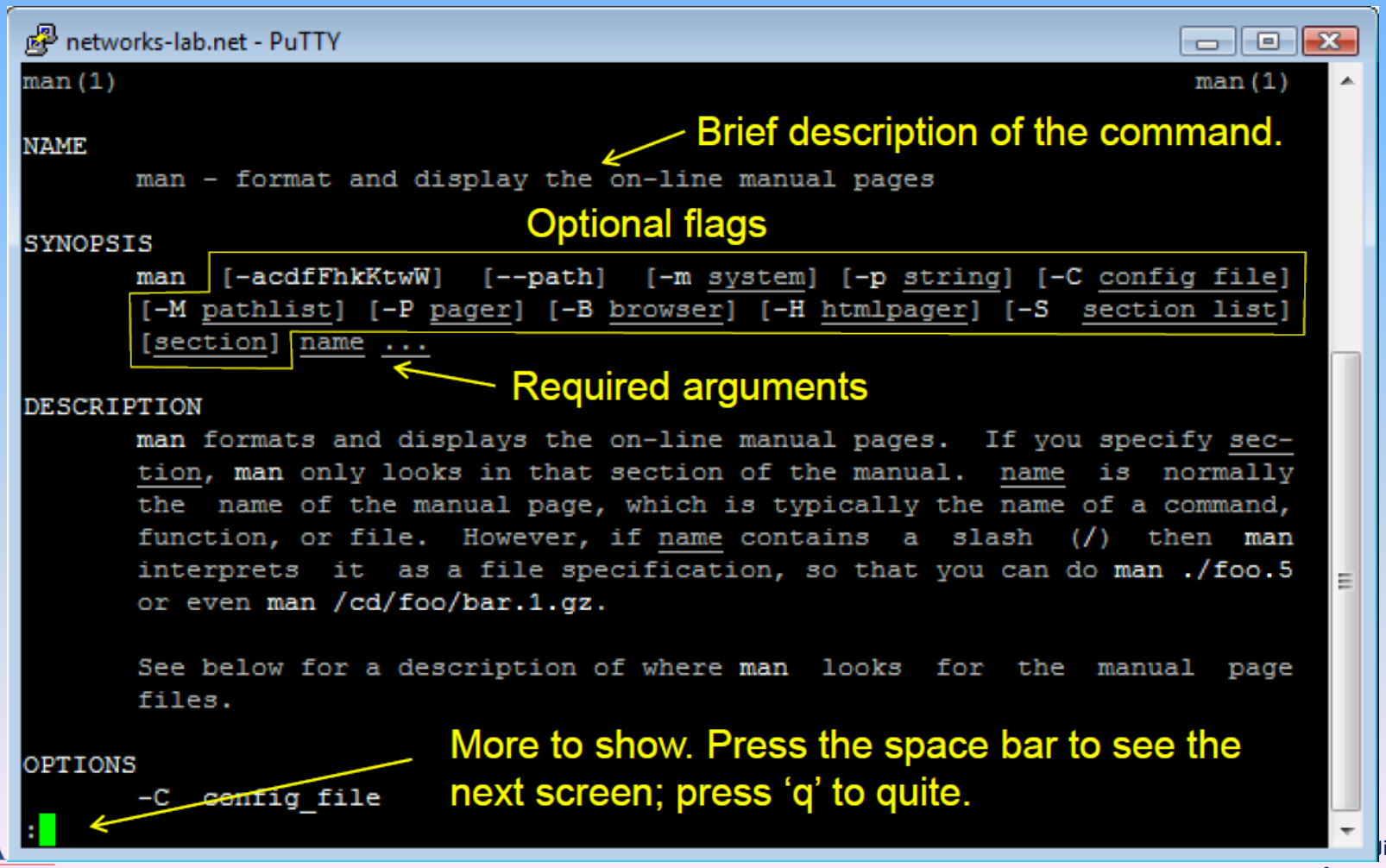
If we type “man man”, we get…

- Manual of `man`



Change Directory

- `cd`
  - *Change Directory* (change the location of current directory to a new one)
  - Syntax: `cd <directory>`
  - Example:

    `cd /var/tmp`

    - change the directory to /var/tmp

    `cd ..`

    - change the directory to parent directory

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Print Current Directory

- `pwd`
  - *Print Working Directory* (print the absolute pathname of the *current working directory*)
  - Syntax: `pwd`
  - Example

```
[prompt]$ pwd
/home
[prompt]$ cd /var/tmp/sycs211
[prompt]$ pwd
/var/tmp/sycs211
[prompt]$ cd ..
[prompt]$ pwd
/var/tmp
```


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Practice

- Login the Linux server
  - Open Putty software in your desktop
  - Input Server IP address: 138.238.148.14 and then connect
  - With a login prompt, input your username and password
    - Username is your initial of your firstname and your full last name
    - Password is your Howard ID with '@'
    - e.g. Jack Smith: jsmith
- After Login
  - Type `id` command to check your account
  - Change your password (`passwd` command)
    - ***Do remember your new password***
    - *You can close Putty and Login again to test your new password*
- Go to course website to download lab1 practice
  - http://www.networks.howard.edu/lij/courses/2016/211/