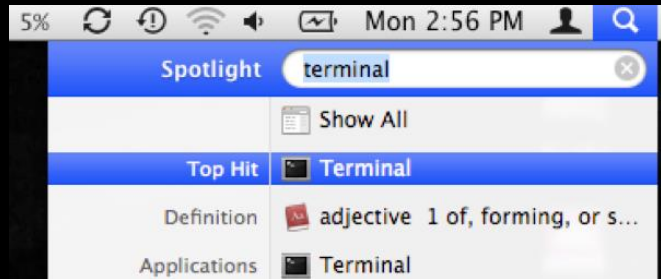# Introduction to Unix

Hui Jiang
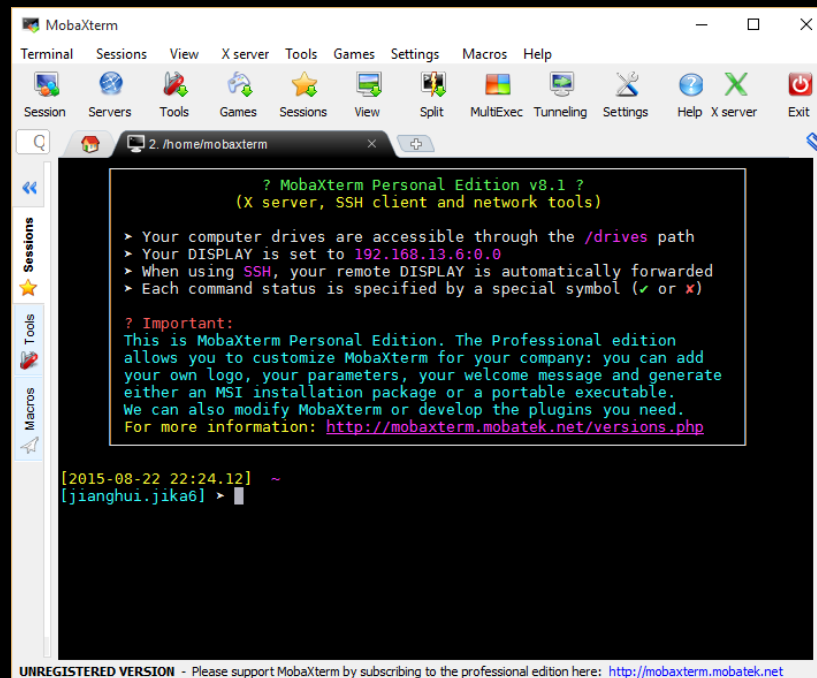
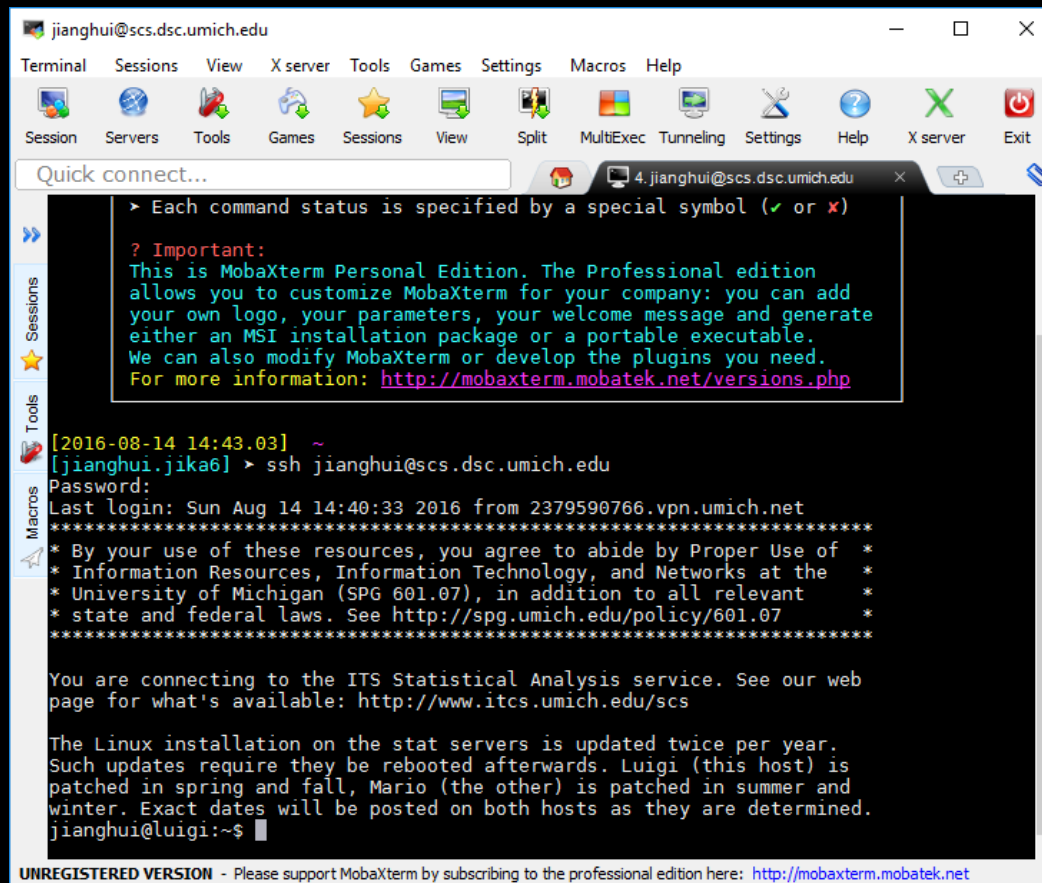jianghui@umich.edu

Getting Started

- Mac users: open a **Terminal**

- Windows users: install **MobaXterm** and then open a terminal

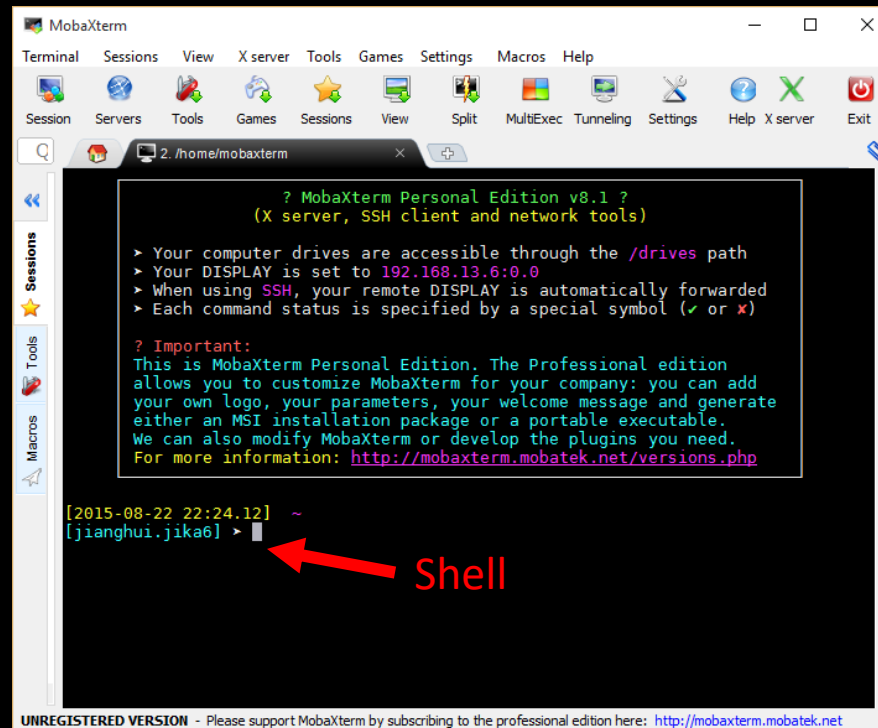# Connecting to a Server

- ssh [your uniqname]@[server host name]

Terminal vs Shell

- Shell: A command-line interface that allows a user to interact with the operating system.

- Terminal [emulator]: A graphical interface (window) to the shell.

Working with Process

- **Process**: A running instance of a program.
- **Job**: A group of processes (from a shell perspective).
- Related commands:
  - **ps**: report a snapshot of the current processes.
  - **top**: provides a real-time view of the running system.
  - **Ctrl-c**: stop a job.
  - **Ctrl-z**: suspend a job.
  - **jobs**: list the active jobs
  - **bg**: resume a suspended job in the background.
  - **fg**: resume a suspended job in the foreground.
  - **kill**: terminate a process
  - **&**: start a job in the background

File System Structure

- Information in the file system is stored in files, which are stored in directories (folders). Directories can also store other directories, which forms a directory tree.
- '/' is used to represent the root directory of the whole file system, and is also used to separate directory names.
- An absolute path (always starts with '/') specifies a location from the root of the file system.
- A relative path (never starts with '/') specifies a location starting from the current location.
- '..' (in a relative path) means the parent directory.
- '.' (in a relative path) means the current directory.
- '~' (in a relative path) means the home directory.

Working with the File System

- **pwd**: print the user's current working directory.
- **cd**: change the current working directory.
- **ls**: print a listing of a specific file or directory.
- **cp**: copy files (or directories).
- **mv**: move files (or directories).
- **rm**: remove files (or directories).
- **mkdir**: create a directory.
- **'*'**: a wildcard matching zero or more characters in file (or directory) names.
- **'?'**: a wildcard matching one character in file (or directory) names.

File Permissions

Working with File Permissions

- **chmod**: change file permission.
- **chown**: change file owner and group.

```
jianghui@mario:~/Private$ touch test.file
jianghui@mario:~/Private$ ls -l test.file
-rw-r--r--. 1 jianghui wheel 0 Aug 22 22:59 test.file
jianghui@mario:~/Private$ chmod 666 test.file
jianghui@mario:~/Private$ ls -l test.file
-rw-rw-rw-. 1 jianghui wheel 0 Aug 22 22:59 test.file
jianghui@mario:~/Private$ chmod +x test.file
jianghui@mario:~/Private$ ls -l test.file
-rwxrwxrwx. 1 jianghui wheel 0 Aug 22 22:59 test.file
```

Compiling Software

- Typical steps needed to install a third party software package:
    1. Locate and download the source code (which is usually compressed)
    2. Unpack the source code
    3. Compile the code
    4. Install the resulting executable
    5. Set paths to the installation directory
- Tutorial at http://www.ee.surrey.ac.uk/Teaching/Unix/unix7.html