

1MD3 Tutorial 10 – Basic Operating System Concept

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1 Environment

In this tutorial we are going to look at Unix like system, although most of you might only have experience with Windows. The first noticeable difference between windows and Unix is that way user interacting with the operating system. On Unix you use a *shell* to talk to the system. A shell is a program where you can type commands. Commands are the only language shell understands. Now let us do it!

1. Get a ssh client which allows you to connect to a Unix machine remotely. **putty** is free and tiny ssh client. You can google it and install it. Double click **putty**, fill “Host Name” with mills.mcmaster.ca, select “SSH” for “Protocol”, then click “Open”.
2. Type your user name you use to log on the computers in the lab, then password.

2 File System

File system is a manager to take care your external storage such as hard driver, floppy, CD-ROM etc. “external” may be confusing since all the devices mentioned is actually inside of a computer. However a computer is consisted by CPU and memory. File system is an external device which provides a way to store information ,it will not disappear when a computer is off.

Now let look at some command for file manipulation.

Unix is case sensitive!

Command “man” tells you more about usage of command. Try “man man”. Brief help information of a command may be gotten by option “-h” or “-help”.

- **ls** list all files in the current directory.
- **cd *des*** enter directory.
- **cp *file des*** copy a file to *des*
- **cat *file*** print the content of a file
- **mkdir *dir*** create a directory.

3 Process

Unix is multitask operating system so there can be more than one process running. For simplicity, let us just assume that each process is running a program. Therefore when a program is invoked the system will

create a process and each process must have a unique id, called *pid*. Since we have had some experience with shell now we can discuss what a shell is and what it does. A shell can be viewed as a tool which only allows user to manage processes. What a shell does is simply to treat whatever you type in as a name of a program then try executing it. In the previous section there are some commands introduced. Each one is a program, when you type them in a shell the shell tries executing it. There are also some commands to manage processes.

- **top** check the status of all processes.
- **ps** list current processes.
- **kill** send a signal to a process, it is named “kill” because the most frequent signal sent to a process is “kill -9 12345” which kills the process 12345.

Examples

```
[caos2@mills ~] top
load averages: 0.04, 0.12, 0.09 15:58:15
86 processes: 84 sleeping, 1 stopped, 1 on cpu
CPU states: % idle, % user, % kernel, % iowait, % swap
Memory: 4096M real, 3343M free, 142M swap in use, 5247M swap free
```

PID	USERNAME	LWP	PRI	NICE	SIZE	RES	STATE	TIME	CPU	COMMAND
10257	caos2	1	59	0	8496K	3320K	sleep	0:00	0.09%	sshd
10337	caos2	1	49	0	3816K	1568K	cpu/3	0:00	0.04%	top
251	root	1	59	0	1288K	976K	sleep	0:01	0.02%	utmpd
7	root	13	59	0	8912K	7760K	sleep	0:09	0.01%	svc.startd
10259	caos2	1	49	0	3048K	2648K	sleep	0:00	0.01%	tcsh
97	root	1	59	0	0K	0K	sleep	0:19	0.00%	ipmon
9	root	15	59	0	9584K	8624K	sleep	0:33	0.00%	svc.configd
146	daemon	4	59	0	4952K	3032K	sleep	0:30	0.00%	kcfcd
349	root	2	59	0	5304K	3184K	sleep	0:22	0.00%	automountd
116	root	25	59	0	4776K	4048K	sleep	0:21	0.00%	nscd
291	root	1	100	-20	2336K	1576K	sleep	0:16	0.00%	xntpd
363	root	14	59	0	3864K	2240K	sleep	0:15	0.00%	syslogd
10335	janicki	1	59	0	12M	7576K	sleep	0:10	0.00%	pine
549	root	1	59	0	18M	7352K	sleep	0:10	0.00%	httpd
398	root	1	59	0	7504K	3048K	sleep	0:06	0.00%	sendmail

```
[caos2@mills ~] ps
  PID TTY          TIME CMD
 10343 pts/6        0:00 ps
 10342 pts/6        0:00 emacs
 10259 pts/6        0:00 tcsh
[caos2@mills ~] kill -9 10342
[caos2@mills ~] ps
  PID TTY          TIME CMD
 10344 pts/6        0:00 ps
 10259 pts/6        0:00 tcsh
[1] + Killed                  emacs -nw
[caos2@mills ~]
```