Process Control

Process

Software program in execution is called process. Each process is identified by a process Identification number (PID). PID 1 is assigned to init, which is the first process that stands at boot time.

To show Process Tree in tree structure

```
pstree
```

List out processes running in system

```
ps
```

Process Status

Status	Meeaning
R	runnable
S	sleeping
T	stopped
D	uninterruptable sleep
Z	zombic
N	low priority process
<	high priority process
w	No resident pages in the memory

Sending Signals to processes

TERM(15) soft signal
KILL(9) strong signal

```
kill -TERM <pid>
kill -15 <pid>
kill <pid>
```

Terminating process

Different ways of ending an application

1. Ending application normally
2. Pressing Ctrl+c
3. Kill –TERM <PID>
4. kill -9 <PID>

Altering Process scheduling priority

Maximum priority that can be assigned: -20

Minimum priority that can be assigned: 19

Default priority: 0

Running process with priority -10 (high) through nice command

```
nice -n -10 find /
```

Modifying process in execution with renice

```
renice -n 11 init
```

To view the background processes use jobs

```
jobs
```

Stopping/suspending a process

```
ctrl+z
```

Resuming the stopped process

Running resumed process in background

```
bg %<jobid>
```

Running resumed process in forground

```
fg %<jobid>
```

Monitoring Process

Locating for valnerable files:

Locate SUID and SGID files and stories named in /root/ stickyfiles:

```
#find / -tpe f -perm +6000 2>/dev/null >/root/sticyfiles
```

Locate world-writable files and store their named in root/world.writable.files:

```
find / type f -perm -2 2>/dev/null>/root/world.writable.files
```

Controlling access to files

1. create a user named shiba
2. create two files in shiba's home directory
3. prevent the payroll file from being deleted

   #chattr +i /home/shiba/payroll
4. verity that the attributes have been changed

   #lsattr /home/shiba/*
5. Try to remove the file

   #rm /home/shiba/payroll

Monitoring processes

Top command

```
top
```

Key Letters

M-sort by memory usage

L-load average display on/off

P – processor Usage

T – Time based sort u – user based sort k – likk process r – to renice sort

s – to update time

Display login and reboot history

```
last
```

To display last reboot time

```
last reboot
```

To display all running progress

```
ps -ax
```

(for detail see man page)

To kill process use kill command (for detail see man)

```
kill -9 <process_id>
```

Display the average lode of CPU and time duration of system running

```
uptime
```