

CSE3241: Operating System and System Programming

Class-5

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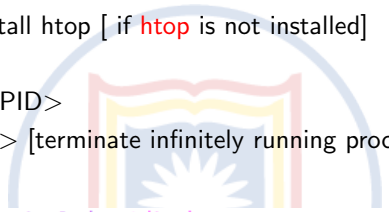
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Know PID of Our Program

Run the following program in one terminal and check its PID and parent's PID in another terminal:

- ▶ \$ sudo apt install htop [if **htop** is not installed]
- ▶ \$ htop
- ▶ \$ pstree -ps <PID>
- ▶ \$ kill -9 <PID> [terminate infinitely running process.]




```
1 #include<stdio.h>
2
3 int main(){
4     for(int i = 0; i <1; i--)
5         printf("Hi\n");
6
7     return 0;
8 }
```

Figure: InfiniteLoop.c

Know PID Inside Our Program

Run the following program again and again and see PIDs.

- ▶ `getpid()` is used to know PID of the process when the executable file of this C code runs.
- ▶ `getppid()` is used to know parent's PID of the process.



```
1 #include<unistd.h>
2 #include<stdio.h>
3
4 int main(){
5     pid_t myPID, parentPID;
6
7     myPID = getpid();
8     parentPID = getppid();
9
10    printf("PID of this process: %u\n", myPID);
11    printf("PID of parent process: %u\n", parentPID);
12
13    return 0;
14 }
```

Figure: PID.c

Process Tree

Processes are arranged in a tree structure, therefore, except the root process, each process has a parent process and 0 – n number of child processes.

In Ubuntu:

- ▶ **sched** has PID: 0.
- ▶ **init** / **systemd** has PID: 1.
 - ▶ it is directly or indirectly the parent process of all processes.
 - ▶ it starts as soon as the computer starts and continue running till, it is shutdown.

To see the process tree, type:

- ▶ `$ pstree`
- ▶ `$ pstree -p`
- ▶ `$ pstree -ps <PID>` [e.g., `$ pstree -ps 1656`]

Schematic diagram of Process Tree in Ubuntu

