

. 如何杀死守护进程 如何杀死守护进程的子进程

提前说明:此题实在受不了输出的信息影响输入和截图故将输出信息重定向到文件 file1 和 file2

程序同 test3-2 只是修改使子进程也进行死循环打印 进程如图

```
[root@RHEL-zby 04]# ./test4-1 >file1 &
[1] 116799
[root@RHEL-zby 04]# ps -a -l
F S    UID      PID    PPID    C PRI   NI ADDR SZ WCHAN  TTY          TIME CMD
1 S      0 116800      1     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116801 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116802 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116804 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116805 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116807 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116809 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116810 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116812 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116813 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116815 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
0 R      0 116817 116039     0  80    0 - 37228 -      pts/1      00:00:00 ps
[1]+  完成                  ./test4-1 > file1
[root@RHEL-zby 04]#
```


杀死一个子进程 直接 kill 进程号

```
[root@RHEL-zby 04]# kill 116801
[root@RHEL-zby 04]# ps -a -l
F S    UID      PID    PPID    C PRI   NI ADDR SZ WCHAN  TTY          TIME CMD
1 S      0 116800      1     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116802 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116804 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116805 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116807 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116809 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116810 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116812 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116813 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
1 S      0 116815 116800     0  80    0 - 1042 hrtime pts/1      00:00:00 test4-1
0 R      0 116846 116039     0  80    0 - 37228 -      pts/1      00:00:00 ps
```

杀死其全部子进程(但是这里产生了僵尸进程 在父进程退出后会被自动清理)
显然还需要改进(之前版本的图 在此只表示修改代码过程)

```
0 R      0  21900  21832  0  80   0  -  37228  -      pts/5    00:00:00 ps
[root@RHEL-zby 04]# for p_pid in `ps -ef |grep test4-1 |grep -v grep |awk '{pri
t $2}'`
> do
> pkill -9 -P $p_pid
> done
[root@RHEL-zby 04]# ps -a -l
F S      UID      PID     PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
0 S      0    21876    21832  0  80   0  -  1042 hrtime pts/5    00:00:00 test4-1
1 Z      0    21879    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21880    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21881    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21882    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21883    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21884    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21885    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
1 Z      0    21886    21876  0  80   0  -      0 do_exi pts/5    00:00:00 test <defunct>
0 R      0    21916    21832  0  80   0  -  37228  -      pts/5    00:00:00 ps
[root@RHEL-zby 04]#
```

修改 test4-1.c 加入 waitpid 函数

```
root@RHEL-zby:/home/homework/1551265-000105-1/04 (ssh) 
#include <stdio.h>
#include <sys/types.h>
#include <signal.h>
#include <string.h>
#include <sys/wait.h>

void func_waitpid(int signo) {
    pid_t pid;
    int stat;
    while( (pid = waitpid(-1, &stat, WNOHANG)) > 0 ) ;
    return;
}

int main()
{
    signal(SIGCHLD, &func_waitpid);
    int i,j;
    pid_t pid1;
    pid1=fork();
    if(pid1==-1)
        return 0;
    if(pid1==0)
    {
        //fork a child process
        for(i=0;i<10;)
        {
            pid_t pid = fork();
            if (pid == 0)
            {
                //child process exit, and to be a zombie process
                for(;;)
                {
                    printf("%d %d 1551265 sub\n",(int)getppid(),(int)getpid());
                    sleep(15);
                }
            }
            i++;
            sleep(3);
        }
        while(1)
        {
            printf("%d %d 1551265 main\n",(int)getppid(),(int)getpid());
            sleep(5);
        }
        return 0;
    }
    if(pid1>0)
        return 0;
}

~
~
~
```

重新执行并删除 达到预期效果

(PS:这里使用了一个 for 循环进行进程的查找 查找所有名为 test4-1 的进程号
删除所有父进程为这些进程号的进程 即可实现此操作)

```
[root@RHEL-zby 04]# ps -a -l
F S  UID    PID    PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
1 S   0 116800      1    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116802 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116804 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116805 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116807 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116809 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116810 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116812 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116813 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 116815 116800    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
0 R   0 116846 116039    0  80   0 - 37228 -      pts/1    00:00:00 ps
[root@RHEL-zby 04]# vi test4-1.c
[root@RHEL-zby 04]# for p_pid in `ps -ef|grep test4-1|grep -v greplawk '{print $2}'`
> do
> pkill -9 -P $p_pid
> done
[root@RHEL-zby 04]# ps -a -l
F S  UID    PID    PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
1 S   0 116800      1    0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
0 R   0 117006 116039    0  80   0 - 37228 -      pts/1    00:00:00 ps
[root@RHEL-zby 04]#
```

杀死其父进程

子进程正常运行未退出 但其父进程 PPID 全部变为 1(init)

```
[root@RHEL-zby 04]# ps -a -l
F S  UID    PID    PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
1 S   0 117079      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117080 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117081 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117083 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117085 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117092 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117095 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117096 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117098 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117100 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117101 117079  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
0 R   0 117110 116039  0  80   0 - 37228 -      pts/1    00:00:00 ps
[root@RHEL-zby 04]# kill 117079
[root@RHEL-zby 04]# ps -a -l
F S  UID    PID    PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
1 S   0 117080      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117081      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117083      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117085      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117092      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117095      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117096      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117098      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117100      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
1 S   0 117101      1  0  80   0 - 1042 hrtime pts/1    00:00:00 test4-1
0 R   0 117128 116039  0  80   0 - 37228 -      pts/1    00:00:00 ps
```

编写 test4-2.c 子进程中加入信号控制函数 prctl

```
root@RHEL-zby:/home/homework/1551265-000105-1/04 (ssh)
#include <stdio.h>
#include <sys/types.h>
#include <signal.h>
#include <string.h>
#include <sys/wait.h>
#include <stdlib.h>
#include <sys/prctl.h>

void func_waitpid(int signo) {
    pid_t pid;
    int stat;
    while( (pid = waitpid(-1, &stat, WNOHANG)) > 0 );
    return;
}

int main()
{
    signal(SIGCHLD, &func_waitpid);
    int i,j;
    pid_t pid1;
    pid1=fork();
    if(pid1==-1)
        return 0;
    if(pid1==0)
    {
        //fork a child process
        for(i=0;i<10;)
        {
            pid_t pid = fork();
            if (pid == 0)
            {
                while(1)
                {
                    prctl(PR_SET_PDEATHSIG, SIGHUP);
                    printf("%d %d 1551265 sub\n", (int)getppid(), (int)getpid());
                    sleep(15);
                }
                exit(0);
            }
            i++;
            sleep(3);
        }
        while(1)
        {
            printf("%d %d 1551265 main\n", (int)getppid(), (int)getpid());
            sleep(5);
        }
        exit(0);
        system("killall test4-2");
    }
    if(pid1>0)
        return 0;
}
~
```

运行程序并 kill 父进程 查看可得子进程全部被杀掉

```
● ● ● root@RHEL-zby:/home/homework/1551265-000105-1/04 (ssh)
[root@RHEL-zby 04]# ps -a -l
F S    UID      PID    PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
1 S      0 117278        1  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117279 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117280 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117282 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117284 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117285 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117287 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117290 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117292 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117294 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
1 S      0 117295 117278  0  80   0 - 1042 hrtime pts/1      00:00:00 test4-2
0 R      0 117300 116039  0  80   0 - 37228 -      pts/1      00:00:00 ps
[root@RHEL-zby 04]# kill 117278
[root@RHEL-zby 04]# ps -a -l
F S    UID      PID    PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
0 R      0 117304 116039  0  80   0 - 37227 -      pts/1      00:00:00 ps
[root@RHEL-zby 04]#
```