# 守护进程的编写和使用方法 04

# 如何杀死守护进程？如何杀死守护进程的子进程？

## 00 test4-1编写

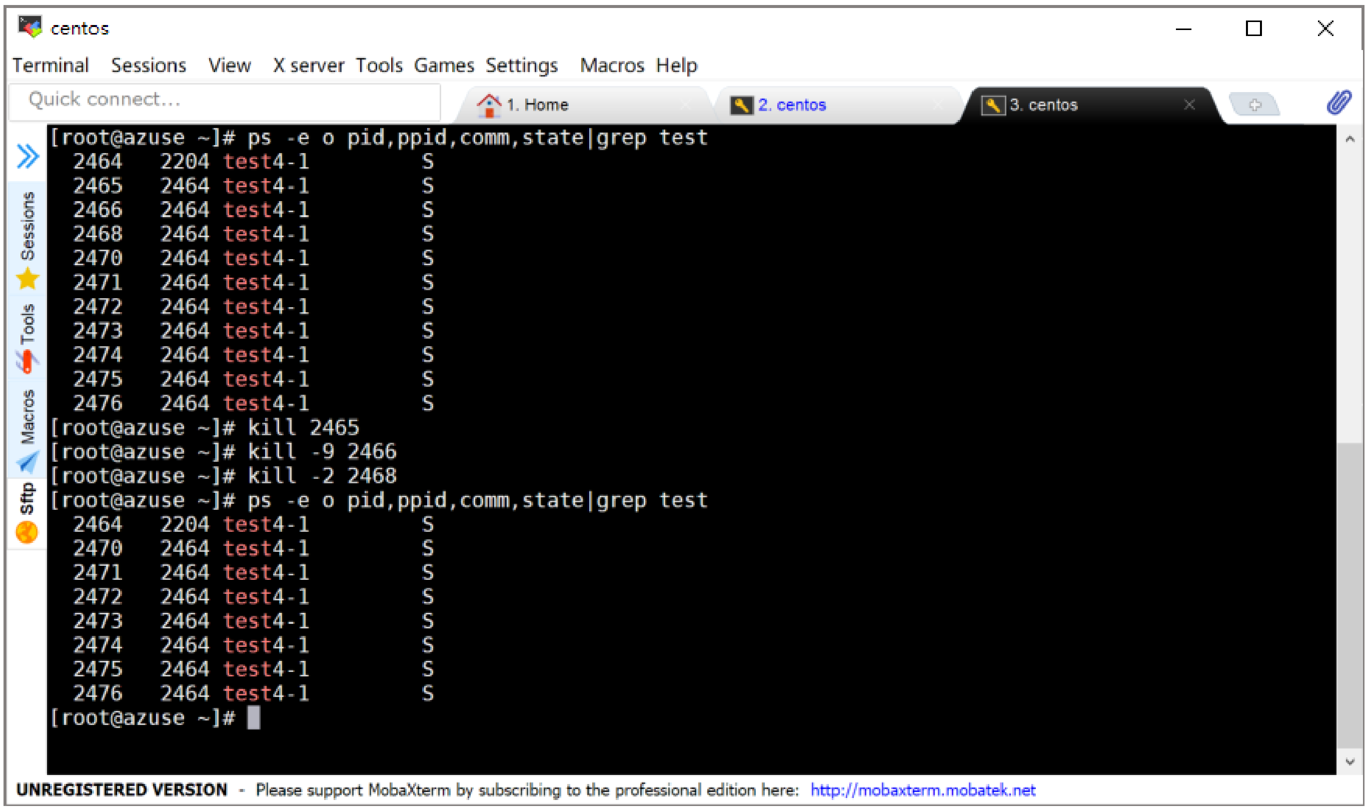
注意要加入回收子进程的方法，这里使用信号机制。

```
// test4-1.c
#include <stdio.h>
#include <unistd.h>
#include <time.h>
#include <errno.h>
#include <stdlib.h>
#include <signal.h>

static void sig_child(int signo);

int main(){
        int pid;
        int i;
        signal(SIGCHLD,sig_child);
        for(i=0;i<10;i++){
                pid = fork();
                if(pid == 0)break;
                else sleep(3);
        }
        int counter = 0;
        while(1){

                if(pid == 0){
                        printf("%d %d 1652238 sub\n",getpid(),getppid());
                        fflush(stdout);
                        sleep(15);
                        counter++;
                        // if(counter == 2){
                        //      printf("sub %d exiting\n",getpid());
                        //      fflush(stdout);
                        //      break;
                        // }
                }else{
                        printf("%d %d 1652238 main\n",getpid(),getppid());
                        fflush(stdout);
                        sleep(5);

                }
        };
        return 0;
}
```

```
static void sig_child(int signo){
        pid_t pid;
        int stat;
        while((pid = waitpid(-1, &stat, WNOHANG)) > 0){
                printf("child %d exited\n",pid);
                fflush(stdout);
        }
}
}
```

## 01 如何杀死test4-1分裂出来的一个子进程?

`kill 子进程pid`

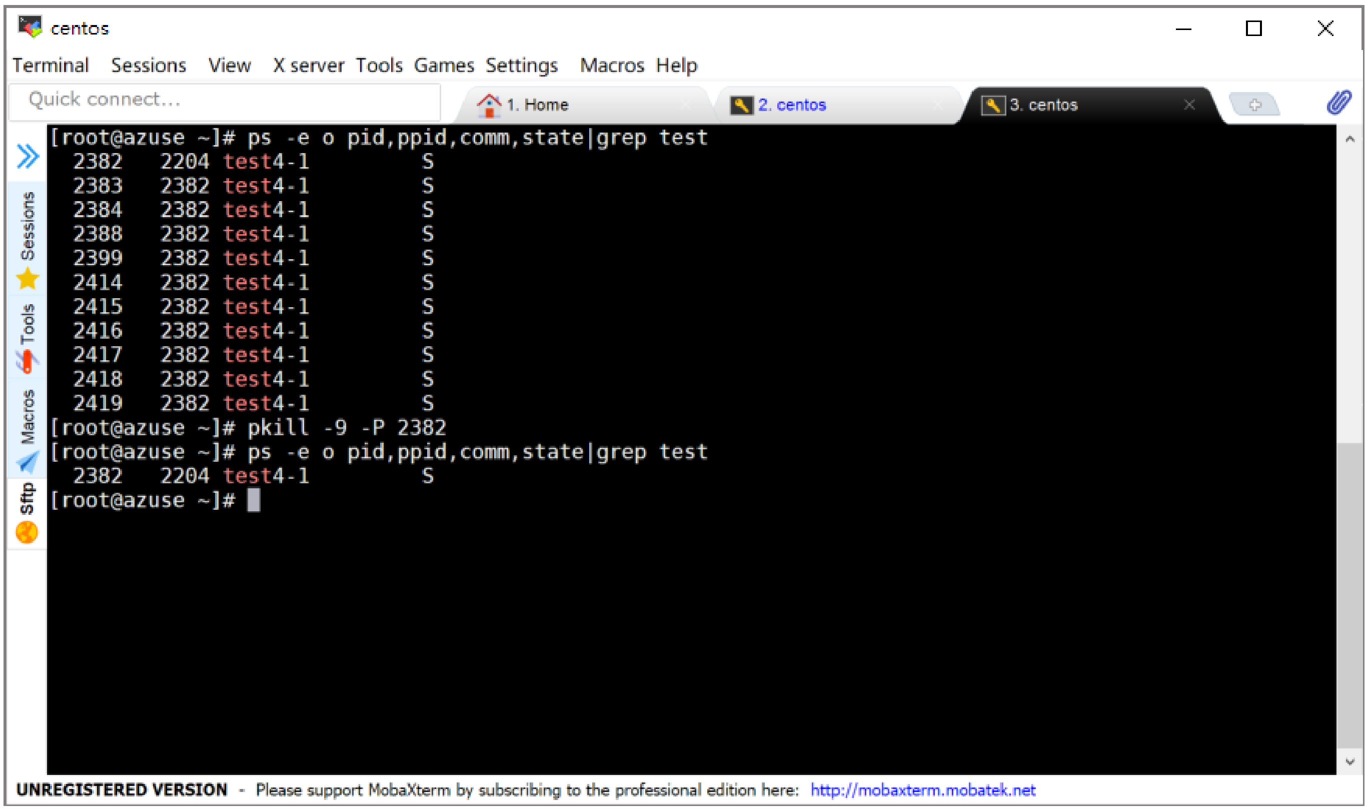


```
[root@azuse ~]# ps -e o pid,ppid,comm,state|grep test
  2464   2204 test4-1         S
  2465   2464 test4-1         S
  2466   2464 test4-1         S
  2468   2464 test4-1         S
  2470   2464 test4-1         S
  2471   2464 test4-1         S
  2472   2464 test4-1         S
  2473   2464 test4-1         S
  2474   2464 test4-1         S
  2475   2464 test4-1         S
  2476   2464 test4-1         S
[root@azuse ~]# kill 2465
[root@azuse ~]# kill -9 2466
[root@azuse ~]# kill -2 2468
[root@azuse ~]# ps -e o pid,ppid,comm,state|grep test
  2464   2204 test4-1         S
  2470   2464 test4-1         S
  2471   2464 test4-1         S
  2472   2464 test4-1         S
  2473   2464 test4-1         S
  2474   2464 test4-1         S
  2475   2464 test4-1         S
  2476   2464 test4-1         S
[root@azuse ~]#
```

**UNREGISTERED VERSION** - Please support MobaXterm by subscribing to the professional edition here: http://mobaxterm.mobatek.net

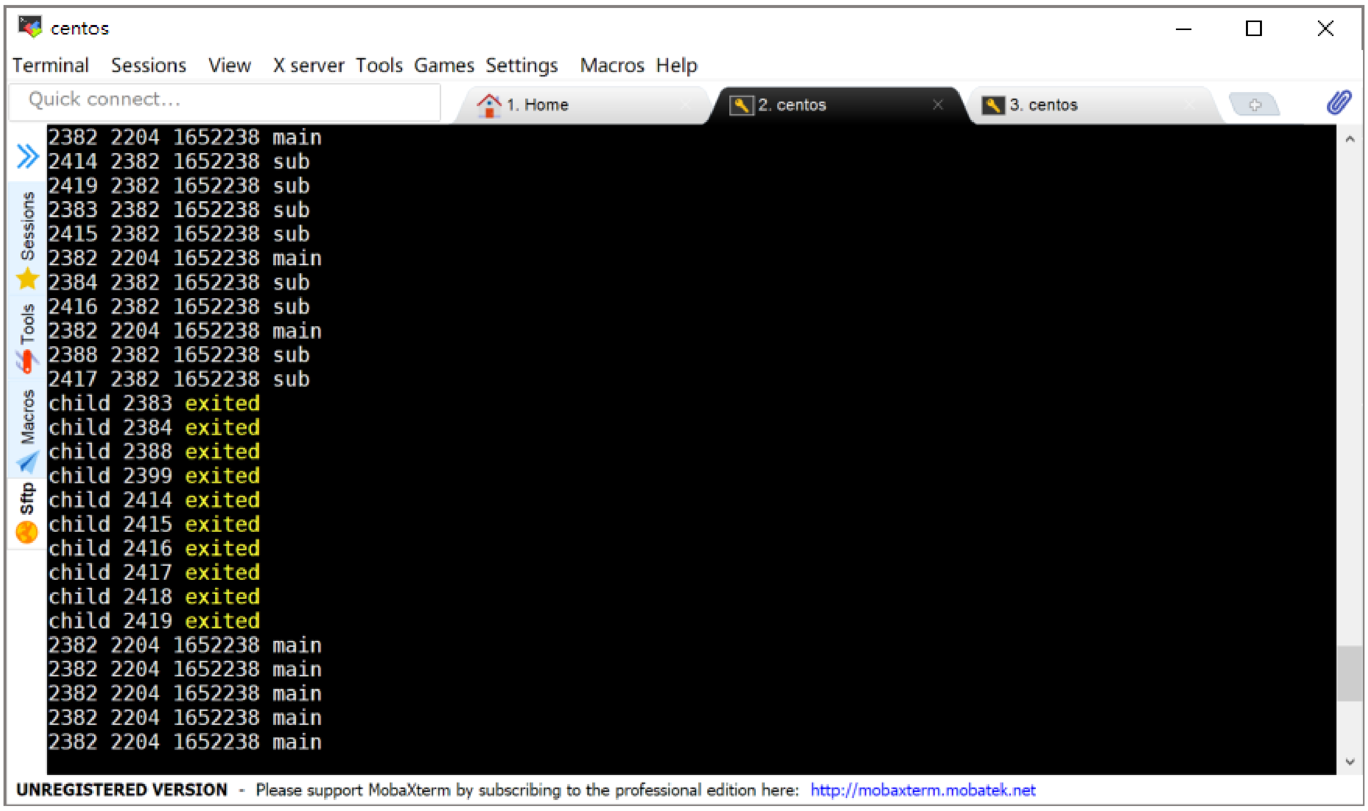
## 02 如何杀死test4-1分裂出来的全部子进程?

`pkill -TERM -P 父进程pid`


centos
Terminal Sessions View X server Tools Games Settings Macros Help
Quick connect...
1. Home
2. centos
3. centos

```
[root@azuse ~]# ps -e o pid,ppid,comm,state|grep test
  2382   2204 test4-1         S
  2383   2382 test4-1         S
  2384   2382 test4-1         S
  2388   2382 test4-1         S
  2399   2382 test4-1         S
  2414   2382 test4-1         S
  2415   2382 test4-1         S
  2416   2382 test4-1         S
  2417   2382 test4-1         S
  2418   2382 test4-1         S
  2419   2382 test4-1         S
[root@azuse ~]# pkill -9 -P 2382
[root@azuse ~]# ps -e o pid,ppid,comm,state|grep test
  2382   2204 test4-1         S
[root@azuse ~]#
```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: http://mobaxterm.mobatek.net

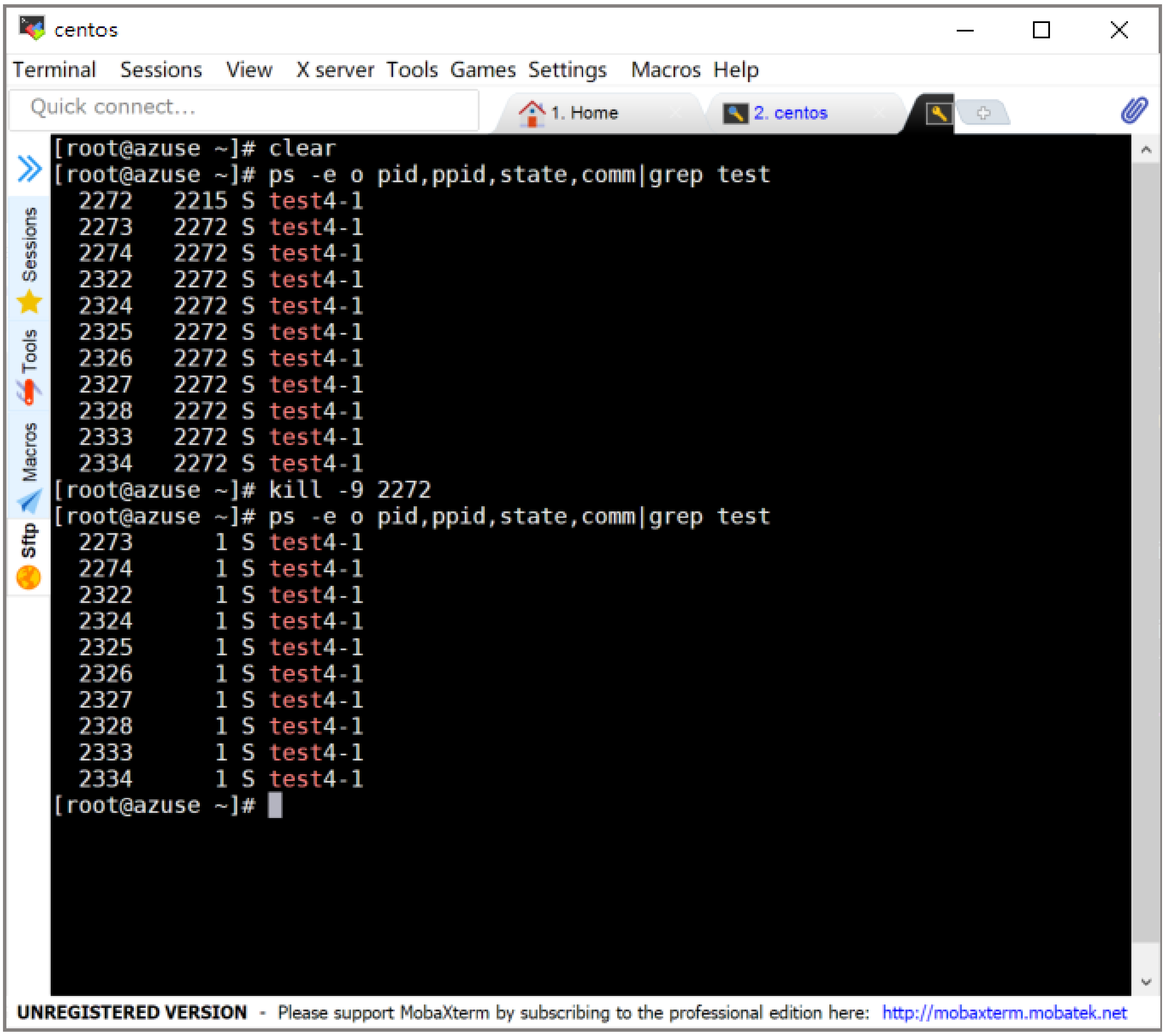

centos
Terminal Sessions View X server Tools Games Settings Macros Help
Quick connect...
1. Home
2. centos
3. centos

```
2382 2204 1652238 main
2414 2382 1652238 sub
2419 2382 1652238 sub
2383 2382 1652238 sub
2415 2382 1652238 sub
2382 2204 1652238 main
2384 2382 1652238 sub
2416 2382 1652238 sub
2382 2204 1652238 main
2388 2382 1652238 sub
2417 2382 1652238 sub
child 2383 exited
child 2384 exited
child 2388 exited
child 2399 exited
child 2414 exited
child 2415 exited
child 2416 exited
child 2417 exited
child 2418 exited
child 2419 exited
2382 2204 1652238 main
2382 2204 1652238 main
2382 2204 1652238 main
2382 2204 1652238 main
2382 2204 1652238 main
```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: http://mobaxterm.mobatek.net

## 03 如果杀死test4-1，其他子进程会发生什么变化？

`kill -9 2272`杀死父进程
发现子进程会变成孤儿进程，之后被init（1号进程）收养


centos
Terminal Sessions View X server Tools Games Settings Macros Help
Quick connect...
1. Home
2. centos
Sessions
Tools
Macros
Sftp
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: http://mobaxterm.mobatek.net

```
[root@azuse ~]# clear
[root@azuse ~]# ps -e o pid,ppid,state,comm|grep test
  2272   2215 S test4-1
  2273   2272 S test4-1
  2274   2272 S test4-1
  2322   2272 S test4-1
  2324   2272 S test4-1
  2325   2272 S test4-1
  2326   2272 S test4-1
  2327   2272 S test4-1
  2328   2272 S test4-1
  2333   2272 S test4-1
  2334   2272 S test4-1
[root@azuse ~]# kill -9 2272
[root@azuse ~]# ps -e o pid,ppid,state,comm|grep test
  2273      1 S test4-1
  2274      1 S test4-1
  2322      1 S test4-1
  2324      1 S test4-1
  2325      1 S test4-1
  2326      1 S test4-1
  2327      1 S test4-1
  2328      1 S test4-1
  2333      1 S test4-1
  2334      1 S test4-1
[root@azuse ~]#
```

## 04 如何让test4-2杀死后，全部子进程自动退出?

使用`prctl(PR_SET_PDEATHSIG, SIGHUP);`设置在父进程终止时向子进程发送`SIGHUP`信号

`man prctl 2`

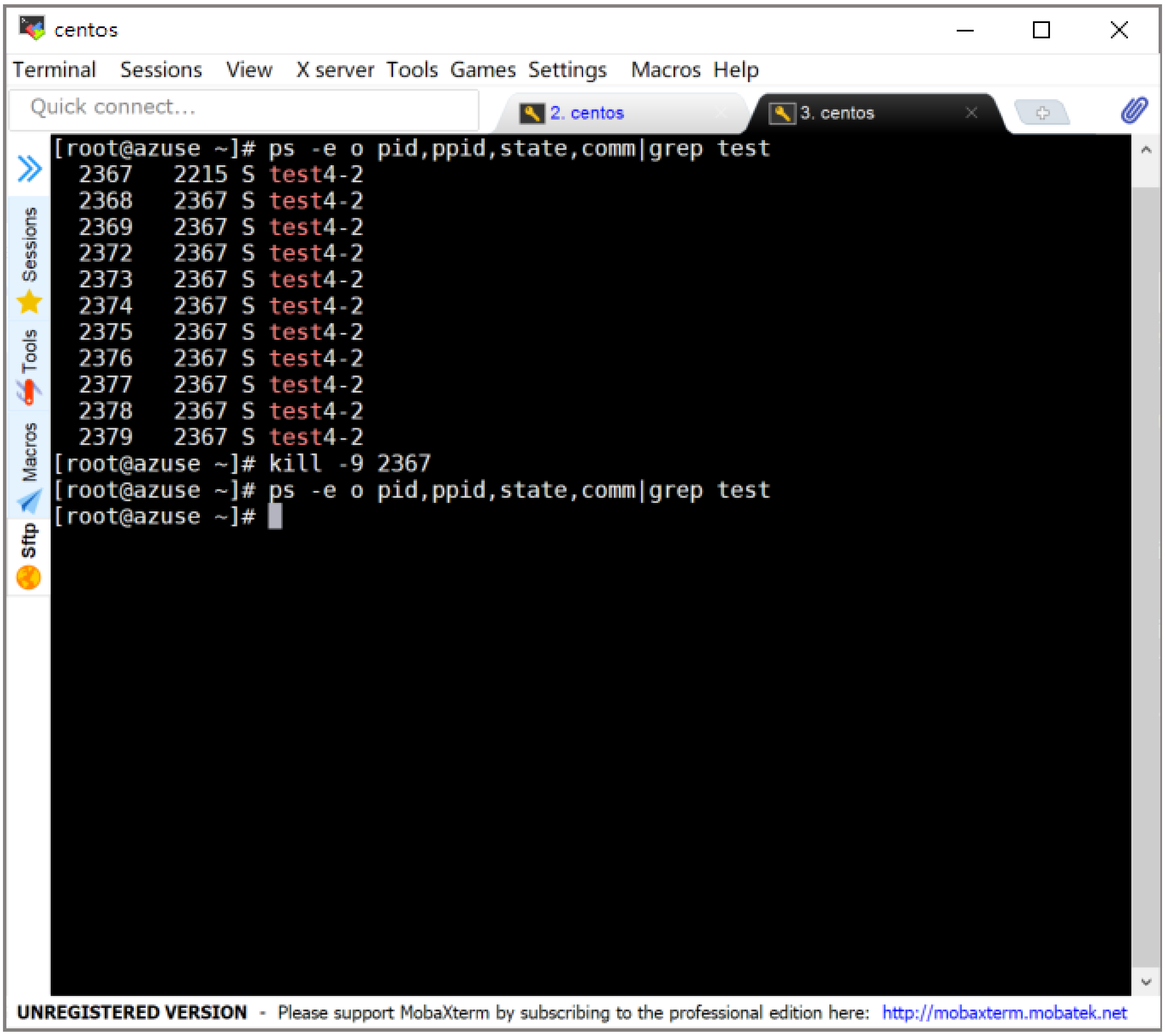
```
PR_SET_PDEATHSIG (since Linux 2.1.57)

                        Set the parent death signal of the calling process to arg2
                        (either a signal value in the range 1..maxsig, or 0 to
clear).
                        This is the signal that the calling process will get when
its

                        parent dies.  This value is cleared for the child of a
fork(2)

                        and (since Linux 2.4.36 / 2.6.23) when executing a set-
user-ID

                        or set-group-ID binary, or a binary that has associated
                        capabilities (see capabilities(7)).  This value is
preserved
```

```
                           across execve(2).

                           Warning: the "parent" in this case is considered to be the
                           thread that created this process.  In other words, the
signal
                           will be sent when that thread terminates (via, for
example,
                           pthread_exit(3)), rather than after all of the threads in
the
                           parent process terminate.
```

test4-2编写：

```
// test4-2.c
#include <stdio.h>
#include <unistd.h>
#include <time.h>
#include <errno.h>
#include <stdlib.h>
#include <signal.h>
#include <sys/prctl.h>

static void sig_child(int signo);

int main(){
        int pid;
        int i;
        signal(SIGCHLD,sig_child);
        for(i=0;i<10;i++){
                pid = fork();
                if(pid == 0){
                        prctl(PR_SET_PDEATHSIG, SIGHUP);
                        break;
                }
                else sleep(3);
        }
        int counter = 0;
        while(1){

                if(pid == 0){
                        printf("%d %d 1652238 sub\n",getpid(),getppid());
                        fflush(stdout);
                        sleep(15);
                        counter++;
                        // if(counter == 2){
                        //      printf("sub %d exiting\n",getpid());
                        //      fflush(stdout);
                        //      break;
                        // }
                }else{
                        printf("%d %d 1652238 main\n",getpid(),getppid());
                        fflush(stdout);
                        sleep(5);

                }
        };
        return 0;
}

static void sig_child(int signo){
        pid_t pid;
        int stat;
        while((pid = waitpid(-1, &stat, WNOHANG)) > 0){
                printf("child %d exited with signal %d\n",pid,signo);
                fflush(stdout);
        }
}
```

测试结果:
`kill -9 2367`后子进程自动退出


centos
Terminal Sessions View X server Tools Games Settings Macros Help
Quick connect...
2. centos
3. centos
Sessions
Tools
Macros
Sftp

```
[root@azuse ~]# ps -e o pid,ppid,state,comm|grep test
  2367   2215 S test4-2
  2368   2367 S test4-2
  2369   2367 S test4-2
  2372   2367 S test4-2
  2373   2367 S test4-2
  2374   2367 S test4-2
  2375   2367 S test4-2
  2376   2367 S test4-2
  2377   2367 S test4-2
  2378   2367 S test4-2
  2379   2367 S test4-2
[root@azuse ~]# kill -9 2367
[root@azuse ~]# ps -e o pid,ppid,state,comm|grep test
[root@azuse ~]# 
```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: http://mobaxterm.mobatek.net