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Subject: [PATCH] Race between cat /proc/kallsyms and rmmod  
Posted by [Alexey Dobriyan](#) on Wed, 14 Mar 2007 11:05:56 GMT  
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Iterating code of /proc/kallsyms calls module\_get\_kallsym() which grabs and drops module\_mutex internally and returns "struct module \*", module is removed, aforementioned "struct module \*" is used in non-trivial way.

So, grab module\_mutex for entire operation like /proc/modules does.

Steps to reproduce:

```
while true; do modprobe xfs; rmmod xfs; done
vs
while true; do cat /proc/kallsyms >/dev/null; done
```

[where xfs could be any module, I haven't tried]

BUG: unable to handle kernel paging request at virtual address e19f808c

```
printing eip:
c01dc361
*pde = 1ff5f067
*pte = 00000000
Oops: 0000 [#1]
PREEMPT
Modules linked in:
CPU: 0
EIP: 0060:[<c01dc361>] Not tainted VLI
EFLAGS: 00010297 (2.6.21-rc3-8b9909ded6922c33c221b105b26917780cfa497d #2)
EIP is at vsnprintf+0x2af/0x48c
eax: e19f808c ebx: ffffffff ecx: e19f808c edx: ffffffff
esi: dbe7aa84 edi: dbe2bf3c ebp: ffffffff esp: dbe2bec4
ds: 007b es: 007b fs: 00d8 gs: 0033 ss: 0068
Process cat (pid: 7242, ti=dbe2b000 task=df5790b0 task.ti=dbe2b000)
Stack: e19d6fde 00000000 00000010 00000008 ffffffff 00000001 00000598 dbe7aa68
0002f362 00000010 dbe7b000 00000000 ffffffff c034bbe0 dbe7aa68 dfd31880
dfa31e80 00001000 c01586b0 dbe2bf2c dbe2bf2c dfd31880 dfd31880 c01289f6
```

Call Trace:

```
[<c01586b0>] seq_printf+0x2e/0x4b
[<c01289f6>] s_show+0x4b/0x7f
[<c0158c6e>] seq_read+0x196/0x278
[<c0158ad8>] seq_read+0x0/0x278
[<c0143c35>] vfs_read+0x72/0x93
[<c0143f1c>] sys_read+0x41/0x67
[<c0102486>] sysenter_past_esp+0x5f/0x85
```

```
=====
Code: 74 24 28 73 03 c6 06 20 46 4d 85 ed 7f f1 e9 b9 00 00 00 8b 0f 81 f9 ff 0f 00 00 b8 ea 45
36 c0 0f 46 c8 8b 54 24 30 89 c8 eb 06 <80> 38 00 74 07 40 4a 83 fa ff 75 f4 29 c8 89 c3 89 e8 f6
```

44 24

EIP: [<c01dc361>] vsnprintf+0x2af/0x48c SS:ESP 0068:dbe2bec4

Signed-off-by: Alexey Dobriyan <adobriyan@sw.ru>

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```
kernel/kallsyms.c | 4 +++++
kernel/module.c   | 5 +----
2 files changed, 5 insertions(+), 4 deletions(-)
```

--- a/kernel/kallsyms.c

+++ b/kernel/kallsyms.c

```
@@ -40,6 +40,8 @@ extern const u16 kallsyms_token_index[]
```

```
extern const unsigned long kallsyms_markers[] __attribute__((weak));
```

```
+extern struct mutex module_mutex;
```

```
+
```

```
static inline int is_kernel_inittext(unsigned long addr)
```

```
{
```

```
    if (addr >= (unsigned long)_sinittext
```

```
@@ -369,6 +371,7 @@ static void *s_next(struct seq_file *m,
```

```
static void *s_start(struct seq_file *m, loff_t *pos)
```

```
{
```

```
+ mutex_lock(&module_mutex);
```

```
    if (!update_iter(m->private, *pos))
```

```
        return NULL;
```

```
    return m->private;
```

```
@@ -376,6 +379,7 @@ static void *s_start(struct seq_file *m,
```

```
static void s_stop(struct seq_file *m, void *p)
```

```
{
```

```
+ mutex_unlock(&module_mutex);
```

```
}
```

```
static int s_show(struct seq_file *m, void *p)
```

--- a/kernel/module.c

+++ b/kernel/module.c

```
@@ -62,7 +62,7 @@ #define INIT_OFFSET_MASK (1UL << (BITS_P
```

```
static DEFINE_SPINLOCK(modlist_lock);
```

```
/* List of modules, protected by module_mutex AND modlist_lock */
```

```
-static DEFINE_MUTEX(module_mutex);
```

```
+DEFINE_MUTEX(module_mutex);
```

```
static LIST_HEAD(modules);
```

```
static BLOCKING_NOTIFIER_HEAD(module_notify_list);
```

```
@@ -2124,19 +2124,16 @@ struct module *module_get_kallsym(unsigned
{
    struct module *mod;

- mutex_lock(&module_mutex);
    list_for_each_entry(mod, &modules, list) {
        if (symnum < mod->num_symtab) {
            *value = mod->symtab[symnum].st_value;
            *type = mod->symtab[symnum].st_info;
            strncpy(name, mod->strtab + mod->symtab[symnum].st_name,
                namelen);
- mutex_unlock(&module_mutex);
            return mod;
        }
        symnum -= mod->num_symtab;
    }
- mutex_unlock(&module_mutex);
    return NULL;
}
```

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Subject: Re: [PATCH] Race between cat /proc/kallsyms and rmmod  
Posted by [Andi Kleen](#) on Wed, 14 Mar 2007 12:11:06 GMT

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Alexey Dobriyan <[adobriyan@sw.ru](mailto:adobriyan@sw.ru)> writes:

```
>
> --- a/kernel/kallsyms.c
> +++ b/kernel/kallsyms.c
> @@ -40,6 +40,8 @@ extern const u16 kallsyms_token_index[]
>
> extern const unsigned long kallsyms_markers[] __attribute__((weak));
>
> +extern struct mutex module_mutex;
```

No externs in .c files

-Andi

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Subject: Re: [PATCH] Race between cat /proc/kallsyms and rmmod  
Posted by [Paulo Marques](#) on Wed, 14 Mar 2007 12:55:09 GMT

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Alexey Dobriyan wrote:

```
> Iterating code of /proc/kallsyms calls module_get_kallsym() which grabs
> and drops module_mutex internally and returns "struct module *",
```

> module is removed, aforementioned "struct module \*" is used in non-trivial  
> way.  
> So, grab module\_mutex for entire operation like /proc/modules does.

I would still prefer the other solution to avoid exposing "module\_mutex"  
outside of module.c like this :(

I'll try to send in a patch today for review.

--

Paulo Marques - [www.grupopie.com](http://www.grupopie.com)

"As far as we know, our computer has never had an undetected error."  
Weisert

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