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Subject: [PATCH] Protect tty drivers list a little

Posted by [Alexey Dobriyan](#) on Thu, 22 Mar 2007 11:18:03 GMT

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Additions and removal from tty\_drivers list were just done as well as iterating on it for /proc/tty/drivers generation.

testing: modprobe/rmmmod loop of simple module which does nothing but tty\_register\_driver() vs cat /proc/tty/drivers loop

BUG: unable to handle kernel paging request at virtual address 6b6b6b6b

printing eip:

c01cefa7

\*pde = 00000000

Oops: 0000 [#1]

PREEMPT

last sysfs file: devices/pci0000:00/0000:00:1d.7/usb5/5-0:1.0/blInterfaceProto col

Modules linked in: ohci\_hcd af\_packet e1000 ehci\_hcd uhci\_hcd usbcore xfs

CPU: 0

EIP: 0060:[<c01cefa7>] Not tainted VLI

EFLAGS: 00010297 (2.6.21-rc4-mm1 #4)

EIP is at vsnprintf+0x3a4/0x5fc

eax: 6b6b6b6b ebx: f6cb50f2 ecx: 6b6b6b6b edx: ffffffff

esi: c0354700 edi: f6cb6000 ebp: 6b6b6b6b esp: f31f5e68

ds: 007b es: 007b fs: 00d8 gs: 0033 ss: 0068

Process cat (pid: 31864, ti=f31f4000 task=c1998030 task.ti=f31f4000)

Stack: 00000000 c0103f20 c013003a c0103f20 00000000 f6cb50da 0000000a 00000f0e

f6cb50f2 00000010 00000014 ffffffff ffffffff 00000007 c0354753 f6cb50f2

f73e39dc f73e39dc 00000001 c0175416 f31f5ed8 f31f5ed4 0ee00000 f32090bc

Call Trace:

[<c0103f20>] restore\_nocheck+0x12/0x15

[<c013003a>] mark\_held\_locks+0x6d/0x86

[<c0103f20>] restore\_nocheck+0x12/0x15

[<c0175416>] seq\_printf+0x2e/0x52

[<c0192895>] show\_tty\_range+0x35/0x1f3

[<c0175416>] seq\_printf+0x2e/0x52

[<c0192add>] show\_tty\_driver+0x8a/0x1d9

[<c01758f6>] seq\_read+0x70/0x2ba

[<c0175886>] seq\_read+0x0/0x2ba

[<c018d8e6>] proc\_reg\_read+0x63/0x9f

[<c015e764>] vfs\_read+0x7d/0xb5

[<c018d883>] proc\_reg\_read+0x0/0x9f

[<c015eab1>] sys\_read+0x41/0x6a

[<c0103e4e>] sysenter\_past\_esp+0x5f/0x99

=====

Code: 00 8b 4d 04 e9 44 ff ff ff 8d 4d 04 89 4c 24 50 8b 6d 00 81 fd ff 0f 00 00 b8 a4 c1 35 c0 0f 46 e8 8b 54 24 2c 89 e9 89 c8 eb 06 <80> 38 00 74 07 40 4a 83 fa ff 75 f4 29 c8 89 c6 8b 44 24 28 89

EIP: [<c01cefa7>] vsnprintf+0x3a4/0x5fc SS:ESP 0068:f31f5e68

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

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```
drivers/char/tty_io.c    | 9 ++++++++-  
fs/proc/proc/tty.c      | 3 +++  
include/linux/tty_driver.h | 2 ++  
3 files changed, 13 insertions(+), 1 deletion(-)
```

--- a/drivers/char/tty\_io.c

+++ b/drivers/char/tty\_io.c

```
@@ -127,6 +127,7 @@ EXPORT_SYMBOL(tty_std_termios);  
    into this file */
```

```
LIST_HEAD(tty_drivers); /* linked list of tty drivers */  
+DEFINE_SPINLOCK(tty_drivers_lock);
```

```
/* Mutex to protect creating and releasing a tty. This is shared with  
   vt.c for deeply disgusting hack reasons */
```

```
@@ -1086,13 +1087,16 @@ static struct tty_driver *get_tty_driver  
{  
    struct tty_driver *p;
```

```
+ spin_lock(&tty_drivers_lock);  
    list_for_each_entry(p, &tty_drivers, tty_drivers) {  
        dev_t base = MKDEV(p->major, p->minor_start);  
        if (device < base || device >= base + p->num)  
            continue;  
+ spin_unlock(&tty_drivers_lock);  
    *index = device - base;  
    return p;  
}  
+ spin_unlock(&tty_drivers_lock);  
    return NULL;  
}
```

```
@@ -3767,7 +3771,9 @@ int tty_register_driver(struct tty_drive  
    if (!driver->put_char)  
        driver->put_char = tty_default_put_char;
```

```
+ spin_lock(&tty_drivers_lock);  
    list_add(&driver->tty_drivers, &tty_drivers);  
+ spin_unlock(&tty_drivers_lock);
```

```
if ( !(driver->flags & TTY_DRIVER_DYNAMIC_DEV) ) {  
    for(i = 0; i < driver->num; i++)
```

```
@@ -3793,8 +3799,9 @@ int tty_unregister_driver(struct tty_dri
```

```

unregister_chrdev_region(MKDEV(driver->major, driver->minor_start),
    driver->num);
-
+ spin_lock(&tty_drivers_lock);
  list_del(&driver->tty_drivers);
+ spin_unlock(&tty_drivers_lock);

/*
 * Free the termios and termios_locked structures because
--- a/fs/proc/proc_tty.c
+++ b/fs/proc/proc_tty.c
@@ -108,6 +108,8 @@ static void *t_start(struct seq_file *m,
{
    struct list_head *p;
    loff_t l = *pos;
+
+ spin_lock(&tty_drivers_lock);
    list_for_each(p, &tty_drivers)
        if (!l--)
            return list_entry(p, struct tty_driver, tty_drivers);
@@ -124,6 +126,7 @@ static void *t_next(struct seq_file *m,

static void t_stop(struct seq_file *m, void *v)
{
+ spin_unlock(&tty_drivers_lock);
}

static struct seq_operations tty_drivers_op = {
--- a/include/linux/tty_driver.h
+++ b/include/linux/tty_driver.h
@@ -118,6 +118,7 @@ #define _LINUX_TTY_DRIVER_H
#include <linux/fs.h>
#include <linux/list.h>
#include <linux/cdev.h>
+#include <linux/spinlock.h>

struct tty_struct;

@@ -216,6 +217,7 @@ struct tty_driver {
};

extern struct list_head tty_drivers;
+extern spinlock_t tty_drivers_lock;

struct tty_driver *alloc_tty_driver(int lines);
void put_tty_driver(struct tty_driver *driver);

```

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