

floating point register corruption

Source: <http://linux.derkeiler.com/Mailing-Lists/Kernel/2005-11/9479.html>

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To: Linux Kernel <linux-kernel@vger.kernel.org>

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Folks,

I recently discovered a bug on PPC which causes the floating point registers to get corrupted when CONFIG_PREEMPT=y.

The problem occurred while running a multi threaded Java application that does floating point. The problem could be reproduced in anywhere from 2 to 6 hours. With the patch I have included below it ran for over a week without failure.

Paolo

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```
--- linux-2.6.15-rc3/arch/ppc/kernel/process.c 2005-11-29
07:01:55.000000000 -0700
+++ new-linux-2.6.15-rc3/arch/ppc/kernel/process.c 2005-11-29
07:20:37.000000000 -0700
@@ -417,6 +417,7 @@
```

```
void exit_thread(void)
{
+ preempt_disable();
    if (last_task_used_math == current)
        last_task_used_math = NULL;
    if (last_task_used_altivec == current)
@@ -425,10 +426,12 @@
    if (last_task_used_spe == current)
        last_task_used_spe = NULL;
#endif
+ preempt_enable();
}
```

```
void flush_thread(void)
{
+ preempt_disable();
    if (last_task_used_math == current)
        last_task_used_math = NULL;
```

Linux-Kernel: floating point register corruption

```
    if (last_task_used_altivec == current)
@@ -437,6 +440,7 @@
    if (last_task_used_spe == current)
        last_task_used_spe = NULL;
#endif
+ preempt_enable();
}

void
@@ -535,6 +539,7 @@
    regs->nip = nip;
    regs->gpr[1] = sp;
    regs->msr = MSR_USER;
+ preempt_disable();
    if (last_task_used_math == current)
        last_task_used_math = NULL;
    if (last_task_used_altivec == current)
@@ -543,6 +548,7 @@
    if (last_task_used_spe == current)
        last_task_used_spe = NULL;
#endif
+ preempt_enable();
    memset(current->thread.fpr, 0, sizeof(current->thread.fpr));
    current->thread.fpscr.val = 0;
#ifdef CONFIG_ALTIVEC
```

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