

[PATCH] cpufreq: fix powernow-k7 smp kernel driver on up machines

Source: <http://linux.derkeiler.com/Mailing-Lists/Kernel/2006-02/msg09668.html>

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 - *Date:* Mon, 27 Feb 2006 21:47:39 +0100
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From: Thomas Meyer <thomas@xxxxxxxx>

This patch fixes the powernow-k7 cpufreq driver smp kernel on an up machine.

Signed-off-by: Thomas Meyer <thomas@xxxxxxxx>

This patch is against branch v2.6.16-rc4. Please give me positive and/or negativ feedback about this fixing approach!

With kind regads

Thomas

```
diff --git a/arch/i386/kernel/cpu/common.c
b/arch/i386/kernel/cpu/common.c
index 7eb9213..67fcee6 100644
--- a/arch/i386/kernel/cpu/common.c
+++ b/arch/i386/kernel/cpu/common.c
@@ -336,6 +336,7 @@ void __devinit identify_cpu(struct cpuinfo
int i;
```

```
c->loops_per_jiffy = loops_per_jiffy;
+ c->cpu_khz = cpu_khz;
c->x86_cache_size = -1;
c->x86_vendor = X86_VENDOR_UNKNOWN;
c->cpuid_level = -1; /* CPUID not detected */
diff --git a/arch/i386/kernel/cpu/cpufreq/powernow-k7.c
b/arch/i386/kernel/cpu/cpufreq/powernow-k7.c
index edcd626..2125026 100644
--- a/arch/i386/kernel/cpu/cpufreq/powernow-k7.c
+++ b/arch/i386/kernel/cpu/cpufreq/powernow-k7.c
@@ -586,7 +586,7 @@ static int __init powernow_cpu_init (str
if (result)
return result;
```

```
- fsb = (10 * cpu_khz) / fid_codes[fidvidstatus.bits.CFID];
+ fsb = (10 * current_cpu_data.cpu_khz) /
```

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```
fid_codes[fidvidstatus.bits.CFID];
if (!fsb) {
printk(KERN_WARNING PFX "can not determine bus frequency\n");
return -EINVAL;
diff --git a/arch/i386/kernel/smpboot.c b/arch/i386/kernel/smpboot.c
diff --git a/arch/i386/kernel/timers/common.c
b/arch/i386/kernel/timers/common.c
index 8163fe0..760add2 100644
--- a/arch/i386/kernel/timers/common.c
+++ b/arch/i386/kernel/timers/common.c
@@ -148,7 +148,9 @@ unsigned long read_timer_tsc(void)
}
```

```
−/* calculate cpu_khz */
+/* calculate cpu_khz for boot_cpu only, because timer_init →
select_timer
+ * calls init_cpu_khz, before boot_cpu_data is transfered to
cpu_data[x]
+ */
void init_cpu_khz(void)
{
if (cpu_has_tsc) {
@@ -170,3 +172,26 @@ void init_cpu_khz(void)
}
```

```
+void init_cpu_khz_smp(void)
+{
+ if (cpu_has(&(current_cpu_data), X86_FEATURE_TSC)) {
+ unsigned long tsc_quotient = calibrate_tsc();
+
+ if (tsc_quotient) {
+ /* report CPU clock rate in Hz.
+ * The formula is (10^6 * 2^32) / (2^32 * 1 / (clocks/us)) =
+ * clock/second. Our precision is about 100 ppm.
+ */
+ { unsigned long eax=0, edx=1000;
+ __asm__ ("divl %2"
+ : "=a" (current_cpu_data.cpu_khz), "=d" (edx)
+ : "r" (tsc_quotient),
+ "0" (eax), "1" (edx));
+ printk("Detected %u.%03u MHz processor.\n",
+ current_cpu_data.cpu_khz / 1000,
+ current_cpu_data.cpu_khz % 1000);
+ }
+ }
+ }
+ }
+ }
diff --git a/arch/i386/kernel/timers/timer_tsc.c
```

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```
b/arch/i386/kernel/timers/timer_tsc.c
index a7f5a2a..0a3e29e 100644
--- a/arch/i386/kernel/timers/timer_tsc.c
+++ b/arch/i386/kernel/timers/timer_tsc.c
@@ -341,23 +341,20 @@ static inline void cpufreq_delayed_get(v

int recalibrate_cpu_khz(void)
{
-#ifndef CONFIG_SMP
- unsigned int cpu_khz_old = cpu_khz;
+ unsigned int cpu_khz_old = current_cpu_data.cpu_khz;

- if (cpu_has_tsc) {
+ if (cpu_has(&(current_cpu_data), X86_FEATURE_TSC)) {
local_irq_disable();
- init_cpu_khz();
+ init_cpu_khz_smp();
local_irq_enable();
- cpu_data[0].loops_per_jiffy =
- cpufreq_scale(cpu_data[0].loops_per_jiffy,
+ current_cpu_data.loops_per_jiffy =
+ cpufreq_scale(current_cpu_data.loops_per_jiffy,
cpu_khz_old,
- cpu_khz);
+ current_cpu_data.cpu_khz);
return 0;
} else
return -ENODEV;
-#else
- return -ENODEV;
-#endif
+
}
EXPORT_SYMBOL(recalibrate_cpu_khz);

diff --git a/include/asm-i386/processor.h b/include/asm-i386/processor.h
index fec5d9..c486001 100644
--- a/include/asm-i386/processor.h
+++ b/include/asm-i386/processor.h
@@ -67,6 +67,7 @@ struct cpuinfo_x86 {
char pad0;
int x86_power;
unsigned long loops_per_jiffy;
+ unsigned int cpu_khz;
unsigned char x86_max_cores; /* cpuid returned max cores value */
unsigned char booted_cores; /* number of cores as seen by OS */
unsigned char apicid;
diff --git a/include/asm-i386/timer.h b/include/asm-i386/timer.h
index aed1643..bbec11d 100644
--- a/include/asm-i386/timer.h
+++ b/include/asm-i386/timer.h
```

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```
@@ -58,6 +58,7 @@ extern struct init_timer_opts timer_cycl
extern unsigned long calibrate_tsc(void);
extern unsigned long read_timer_tsc(void);
extern void init_cpu_khz(void);
+extern void init_cpu_khz_smp(void);
extern int recalibrate_cpu_khz(void);
#ifdef CONFIG_HPET_TIMER
extern struct init_timer_opts timer_hpet_init;
```

—

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