
Subject: [PATCH 1/3] Introduce cpuid_on_cpu() and cpuid_eax_on_cpu()
Posted by [Alexey Dobriyan](#) on Mon, 02 Apr 2007 11:32:05 GMT
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They will be used by cpuid driver and powernow-k8 cpufreq driver.

With these changes powernow-k8 driver could run correctly on OpenVZ kernels with virtual cpus enabled (SCHED_VCPU).

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

```
arch/i386/lib/Makefile      | 2 -
arch/i386/lib/cpuid-on-cpu.c | 67 +++++
arch/x86_64/lib/Makefile    | 2 -
arch/x86_64/lib/cpuid-on-cpu.c | 1
include/asm-i386/processor.h | 15 +++++
include/asm-x86_64/msr.h    | 13 +++++
6 files changed, 98 insertions(+), 2 deletions(-)
```

```
--- a/arch/i386/lib/Makefile
+++ b/arch/i386/lib/Makefile
@@ -8,4 +8,4 @@ lib-y = checksum.o delay.o usercopy.o getuser.o putuser.o memcpy.o strstr.o \
```

```
lib-$(CONFIG_X86_USE_3DNOW) += mmx.o
```

```
-obj-$(CONFIG_SMP) += msr-on-cpu.o
+obj-$(CONFIG_SMP) += cpuid-on-cpu.o msr-on-cpu.o
--- a/arch/x86_64/lib/Makefile
+++ b/arch/x86_64/lib/Makefile
@@ -5,7 +5,7 @@
CFLAGS_csum-partial.o := -funroll-loops
```

```
obj-y := io.o iomap_copy.o
-obj-$(CONFIG_SMP) += msr-on-cpu.o
+obj-$(CONFIG_SMP) += cpuid-on-cpu.o msr-on-cpu.o
```

```
lib-y := csum-partial.o csum-copy.o csum-wrappers.o delay.o \
usercopy.o getuser.o putuser.o \
--- a/include/asm-i386/processor.h
+++ b/include/asm-i386/processor.h
@@ -643,6 +643,21 @@ static inline unsigned int cpuid_edx(unsigned int op)
return edx;
}
```

```
+#ifdef CONFIG_SMP
+void cpuid_on_cpu(unsigned int cpu, u32 op, u32 *eax, u32 *ebx, u32 *ecx, u32 *edx);
```

```

+u32 cpuid_eax_on_cpu(unsigned int cpu, u32 op);
+
+static inline void cpuid_on_cpu(unsigned int cpu, u32 op, u32 *eax, u32 *ebx, u32 *ecx, u32
+*edx)
+{
+ cpuid(op, eax, ebx, ecx, edx);
+}
+
+static inline u32 cpuid_eax_on_cpu(unsigned int cpu, u32 op)
+{
+ return cpuid_eax(op);
+}
+
+
+/* generic versions from gas */
+#define GENERIC_NOP1 ".byte 0x90\n"
+#define GENERIC_NOP2 ".byte 0x89,0xf6\n"
+--- a/include/asm-x86_64/msr.h
++++ b/include/asm-x86_64/msr.h
@@ -163,6 +163,9 @@ static inline unsigned int cpuid_edx(unsigned int op)
#ifdef CONFIG_SMP
void rdmsr_on_cpu(unsigned int cpu, u32 msr_no, u32 *l, u32 *h);
void wrmsr_on_cpu(unsigned int cpu, u32 msr_no, u32 l, u32 h);
+
+void cpuid_on_cpu(unsigned int cpu, u32 op, u32 *eax, u32 *ebx, u32 *ecx, u32 *edx);
+u32 cpuid_eax_on_cpu(unsigned int cpu, u32 op);
+
+/* CONFIG_SMP */
+static inline void rdmsr_on_cpu(unsigned int cpu, u32 msr_no, u32 *l, u32 *h)
+{
+
+@@ -172,6 +175,16 @@ static inline void wrmsr_on_cpu(unsigned int cpu, u32 msr_no, u32 l,
+u32 h)
+{
+ wrmsr(msr_no, l, h);
+}
+
+static inline void cpuid_on_cpu(unsigned int cpu, u32 op, u32 *eax, u32 *ebx, u32 *ecx, u32
+*edx)
+{
+ cpuid(op, eax, ebx, ecx, edx);
+}
+
+static inline u32 cpuid_eax_on_cpu(unsigned int cpu, u32 op)
+{
+ return cpuid_eax(op);
+}
+
+endif /* CONFIG_SMP */
+
+endif

```

```

--- /dev/null
+++ b/arch/i386/lib/cpuid-on-cpu.c
@@ -0,0 +1,67 @@
#include <linux/module.h>
#include <linux/preempt.h>
#include <linux/smp.h>
#include <linux/types.h>
+
+struct cpuid_info {
+ u32 op;
+ u32 eax, ebx, ecx, edx;
+};
+
+static void __cpuid_on_cpu(void *info)
+{
+ struct cpuid_info *rv = info;
+
+ cpuid(rv->op, &rv->eax, &rv->ebx, &rv->ecx, &rv->edx);
+}
+
+void cpuid_on_cpu(unsigned int cpu, u32 op, u32 *eax, u32 *ebx, u32 *ecx, u32 *edx)
+{
+ preempt_disable();
+ if (smp_processor_id() == cpu)
+ cpuid(op, eax, ebx, ecx, edx);
+ else {
+ struct cpuid_info rv;
+
+ rv.op = op;
+ smp_call_function_single(cpu, __cpuid_on_cpu, &rv, 0, 1);
+ *eax = rv.eax;
+ *ebx = rv.ebx;
+ *ecx = rv.ecx;
+ *edx = rv.edx;
+ }
+ preempt_enable();
+}
+
+struct cpuid_eax_info {
+ u32 op;
+ u32 eax;
+};
+
+static void __cpuid_eax_on_cpu(void *info)
+{
+ struct cpuid_info *rv = info;
+
+ rv->eax = cpuid_eax(rv->op);

```

```

+}
+
+u32 cpuid_eax_on_cpu(unsigned int cpu, u32 op)
+{
+ u32 ret;
+
+ preempt_disable();
+ if (smp_processor_id() == cpu)
+  ret = cpuid_eax(op);
+ else {
+  struct cpuid_eax_info rv;
+
+  rv.op = op;
+  smp_call_function_single(cpu, __cpuid_eax_on_cpu, &rv, 0, 1);
+  ret = rv.eax;
+ }
+ preempt_enable();
+ return ret;
+}
+
+EXPORT_SYMBOL(cpuid_on_cpu);
+EXPORT_SYMBOL(cpuid_eax_on_cpu);
--- /dev/null
+++ b/arch/x86_64/lib/cpuid-on-cpu.c
@@ -0,0 +1 @@
+#include "../../i386/lib/cpuid-on-cpu.c"

```
