

IRQ handling difference between i386 and x86_64

Source: <http://linux.derkeiler.com/Mailing-Lists/Kernel/2007-06/msg12434.html>

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Hello,

It seems that IRQ handling is somehow different between i386 and x86_64.

In my Dell PowerEdge 1950 it is possible to enable interrupts spreading over all CPUs. This a single CPU, four CORE system (Quad-Core E5335 Xeon) so I think that interrupts migration may be useful. Unfortunately, it works only with 32-bit kernel. Booting it with x86_64 leads to situation, when all interrupts goes only to the first cpu matching a smp_affinity mask.

```
# cat /proc/interrupts (i386)
CPU0 CPU1 CPU2 CPU3
0: 402 1 3 3 IO-APIC-edge timer
1: 1 0 1 0 IO-APIC-edge i8042
8: 13 13 12 13 IO-APIC-edge rtc
9: 0 0 0 0 IO-APIC-fasteoi acpi
12: 1 1 0 2 IO-APIC-edge i8042
14: 5 4 4 4 IO-APIC-edge libata
15: 0 0 0 0 IO-APIC-edge libata
20: 0 0 0 0 IO-APIC-fasteoi libata
21: 1428 1434 1433 1435 IO-APIC-fasteoi ioc0
22: 6 6 6 6 IO-APIC-fasteoi ehci_hcd:usb1, uhci_hcd:usb2, uhci_hcd:usb4
23: 18 24 23 18 IO-APIC-fasteoi uhci_hcd:usb3
212: 1 1 1 0 PCI-MSI-edge eth1
213: 1045 1039 1039 1041 PCI-MSI-edge eth0
214: 0 0 0 0 PCI-MSI-edge ioat
NMI: 0 0 0 0 LOC: 3284200 3283865 3286809 3283934 ERR: 0
MIS: 0
```

```
# cat /proc/interrupts (x86_64)
CPU0 CPU1 CPU2 CPU3
0: 330199 0 0 0 IO-APIC-edge timer
1: 2 0 0 0 IO-APIC-edge i8042
8: 16 0 0 0 IO-APIC-edge rtc
9: 0 0 0 0 IO-APIC-fasteoi acpi
12: 4 0 0 0 IO-APIC-edge i8042
14: 16 0 0 0 IO-APIC-edge libata
15: 0 0 0 0 IO-APIC-edge libata
20: 48 0 0 0 IO-APIC-fasteoi uhci_hcd:usb3
21: 24 0 0 0 IO-APIC-fasteoi ehci_hcd:usb1, uhci_hcd:usb2, uhci_hcd:usb4
```

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```
23: 0 0 0 0 IO-APIC-fasteoi libata
64: 5104 0 0 0 IO-APIC-fasteoi ioc0
372: 3 0 0 0 PCI-MSI-edge eth1
373: 540 0 0 0 PCI-MSI-edge eth0
374: 0 0 0 0 PCI-MSI-edge ioat
NMI: 0 0 0 0 LOC: 330055 330041 329953 329858 ERR: 0
```

Please notice also that irq numbers are different:

- libata: 20 on i386, 23 on x86_64
- ioc: 21 on i386, 64 on x86_64
- ehci_hcd:usb1: 22 on i386, 21 on x86_64
- uhci_hcd:usb3: 23 on i386, 20 on x86_64
- eth1, eth0, ioat: 212/213/214 on i386, 372/373/374 on x86_64

Two question:

- Is it possible to make irq spreading working on x86_64?
- Why the irq numbers are different?

Attaching dmesg and lspci from both i386 and x86_64.

Best regards,

Krzysztof Ol dzkiLinux version 2.6.21.5 (root@fish1) (gcc version 4.1.2 (Gentoo 4.1.2)) #1 SMP PREEMPT
Fri Jun 29 00:34:22 CEST 2007

BIOS-provided physical RAM map:

sanitize start

sanitize end

copy_e820_map() start: 0000000000000000 size: 00000000000a0000 end: 00000000000a0000 type: 1

copy_e820_map() type is E820_RAM

copy_e820_map() start: 0000000001000000 size: 00000000cfea8000 end: 00000000cffa8000 type: 1

copy_e820_map() type is E820_RAM

copy_e820_map() start: 00000000cffa8000 size: 000000000000fc00 end: 00000000cffb7c00 type: 3

copy_e820_map() start: 00000000cffb7c00 size: 0000000000048400 end: 00000000d0000000 type: 2

copy_e820_map() start: 00000000e0000000 size: 0000000010000000 end: 00000000f0000000 type: 2

copy_e820_map() start: 00000000fe000000 size: 0000000020000000 end: 0000000100000000 type: 2

copy_e820_map() start: 0000000100000000 size: 0000000030000000 end: 0000000130000000 type: 1

copy_e820_map() type is E820_RAM

BIOS-e820: 0000000000000000 - 00000000000a0000 (usable)

BIOS-e820: 0000000001000000 - 00000000cffa8000 (usable)

BIOS-e820: 00000000cffa8000 - 00000000cffb7c00 (ACPI data)

BIOS-e820: 00000000cffb7c00 - 00000000d0000000 (reserved)

BIOS-e820: 00000000e0000000 - 00000000f0000000 (reserved)

BIOS-e820: 00000000fe000000 - 0000000100000000 (reserved)

BIOS-e820: 0000000100000000 - 0000000130000000 (usable)

3968MB HIGHMEM available.

896MB LOWMEM available.

found SMP MP-table at 000fe710

NX (Execute Disable) protection: active

Entering add_active_range(0, 0, 1245184) 0 entries of 256 used

Zone PFN ranges:

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DMA 0 -> 4096
Normal 4096 -> 229376
HighMem 229376 -> 1245184
early_node_map[1] active PFN ranges
0: 0 -> 1245184
On node 0 totalpages: 1245184
DMA zone: 32 pages used for memmap
DMA zone: 0 pages reserved
DMA zone: 4064 pages, LIFO batch:0
Normal zone: 1760 pages used for memmap
Normal zone: 223520 pages, LIFO batch:31
HighMem zone: 7936 pages used for memmap
HighMem zone: 1007872 pages, LIFO batch:31
DMI 2.4 present.
ACPI: RSDP 000F2620, 0024 (r2 DELL)
ACPI: XSDT 000F26A0, 004C (r1 DELL PE_SC3 1 DELL 1)
ACPI: FACP 000F27A8, 00F4 (r3 DELL PE_SC3 1 DELL 1)
ACPI: DSDT CFFA8000, 3C53 (r1 DELL PE_SC3 1 MSFT 100000E)
ACPI: FACS CFFB7C00, 0040
ACPI: APIC 000F289C, 00C8 (r1 DELL PE_SC3 1 DELL 1)
ACPI: SPCR 000F297D, 0050 (r1 DELL PE_SC3 1 DELL 1)
ACPI: HPET 000F29CD, 0038 (r1 DELL PE_SC3 1 DELL 1)
ACPI: MCFG 000F2A05, 003C (r1 DELL PE_SC3 1 DELL 1)
ACPI: PM-Timer IO Port: 0x808
ACPI: Local APIC address 0xfe00000
ACPI: LAPIC (acpi_id[0x01] lapic_id[0x00] enabled)
Processor #0 6:15 APIC version 20
ACPI: LAPIC (acpi_id[0x02] lapic_id[0x01] enabled)
Processor #1 6:15 APIC version 20
ACPI: LAPIC (acpi_id[0x03] lapic_id[0x02] enabled)
Processor #2 6:15 APIC version 20
ACPI: LAPIC (acpi_id[0x04] lapic_id[0x03] enabled)
Processor #3 6:15 APIC version 20
ACPI: LAPIC (acpi_id[0x05] lapic_id[0x14] disabled)
ACPI: LAPIC (acpi_id[0x06] lapic_id[0x15] disabled)
ACPI: LAPIC (acpi_id[0x07] lapic_id[0x16] disabled)
ACPI: LAPIC (acpi_id[0x08] lapic_id[0x17] disabled)
ACPI: LAPIC_NMI (acpi_id[0x01] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x02] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x03] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x04] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x05] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x06] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x07] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x08] high edge lint[0x1])
ACPI: IOAPIC (id[0x04] address[0xfec00000] gsi_base[0])
IOAPIC[0]: apic_id 4, version 32, address 0xfec00000, GSI 0-23
ACPI: IOAPIC (id[0x05] address[0xfec81000] gsi_base[64])
IOAPIC[1]: apic_id 5, version 32, address 0xfec81000, GSI 64-87
ACPI: INT_SRC_OVR (bus 0 bus_irq 0 global_irq 2 dfl dfl)
ACPI: INT_SRC_OVR (bus 0 bus_irq 9 global_irq 9 high level)

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ACPI: IRQ0 used by override.
ACPI: IRQ2 used by override.
ACPI: IRQ9 used by override.
Enabling APIC mode: Flat. Using 2 I/O APICs
ACPI: HPET id: 0x8086a201 base: 0xfed00000
Using ACPI (MADT) for SMP configuration information
Allocating PCI resources starting at d1000000 (gap: d0000000:10000000)
Built 1 zonelists. Total pages: 1235456
Kernel command line: BOOT_IMAGE=Linux-2.6.21.5 ro root=900 rootflags=data=journal
mapped APIC to fffd000 (fee00000)
mapped IOAPIC to fffc000 (fec00000)
mapped IOAPIC to fffb000 (fec81000)
Enabling fast FPU save and restore... done.
Enabling unmasked SIMD FPU exception support... done.
Initializing CPU#0
PID hash table entries: 4096 (order: 12, 16384 bytes)
Detected 1995.029 MHz processor.
Console: colour VGA+ 80x30
Dentry cache hash table entries: 131072 (order: 7, 524288 bytes)
Inode-cache hash table entries: 65536 (order: 6, 262144 bytes)
Memory: 4148144k/4980736k available (2846k kernel code, 44676k reserved, 1235k data, 200k init, 3276448k highmem)
virtual kernel memory layout:
fixmap : 0xffff83000 - 0xfffff000 (496 kB)
pkmap : 0xffc00000 - 0xffe00000 (2048 kB)
vmalloc : 0xf8800000 - 0xffbfe000 (115 MB)
lowmem : 0xc0000000 - 0xf8000000 (896 MB)
.init : 0xc0505000 - 0xc0537000 (200 kB)
.data : 0xc03c7915 - 0xc04fc710 (1235 kB)
.text : 0xc0100000 - 0xc03c7915 (2846 kB)
Checking if this processor honours the WP bit even in supervisor mode... Ok.
hpet0: at MMIO 0xfed00000, IRQs 2, 8, 0
hpet0: 3 64-bit timers, 14318180 Hz
Calibrating delay using timer specific routine.. 3992.32 BogoMIPS (lpj=1996160)
Mount-cache hash table entries: 512
CPU: After generic identify, caps: bfebfbff 20100000 00000000 00000000 0004e33d 00000000 00000001
monitor/mwait feature present.
using mwait in idle threads.
CPU: L1 I cache: 32K, L1 D cache: 32K
CPU: L2 cache: 4096K
CPU: Physical Processor ID: 0
CPU: Processor Core ID: 0
CPU: After all inits, caps: bfebfbff 20100000 00000000 00003940 0004e33d 00000000 00000001
Intel machine check architecture supported.
Intel machine check reporting enabled on CPU#0.
Checking 'hlt' instruction... OK.
SMP alternatives: switching to UP code
ACPI: Core revision 20070126
CPU0: Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07
SMP alternatives: switching to SMP code
Booting processor 1/1 eip 3000

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Initializing CPU#1

Calibrating delay using timer specific routine.. 3990.00 BogoMIPS (lpj=1995001)

CPU: After generic identify, caps: bfebfbff 20100000 00000000 00000000 0004e33d 00000000 00000001
monitor/mwait feature present.

CPU: L1 I cache: 32K, L1 D cache: 32K

CPU: L2 cache: 4096K

CPU: Physical Processor ID: 0

CPU: Processor Core ID: 1

CPU: After all inits, caps: bfebfbff 20100000 00000000 00003940 0004e33d 00000000 00000001

Intel machine check architecture supported.

Intel machine check reporting enabled on CPU#1.

CPU1: Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07

SMP alternatives: switching to SMP code

Booting processor 2/2 eip 3000

Initializing CPU#2

Calibrating delay using timer specific routine.. 3990.01 BogoMIPS (lpj=1995009)

CPU: After generic identify, caps: bfebfbff 20100000 00000000 00000000 0004e33d 00000000 00000001
monitor/mwait feature present.

CPU: L1 I cache: 32K, L1 D cache: 32K

CPU: L2 cache: 4096K

CPU: Physical Processor ID: 0

CPU: Processor Core ID: 2

CPU: After all inits, caps: bfebfbff 20100000 00000000 00003940 0004e33d 00000000 00000001

Intel machine check architecture supported.

Intel machine check reporting enabled on CPU#2.

CPU2: Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07

SMP alternatives: switching to SMP code

Booting processor 3/3 eip 3000

Initializing CPU#3

Calibrating delay using timer specific routine.. 3990.01 BogoMIPS (lpj=1995006)

CPU: After generic identify, caps: bfebfbff 20100000 00000000 00000000 0004e33d 00000000 00000001
monitor/mwait feature present.

CPU: L1 I cache: 32K, L1 D cache: 32K

CPU: L2 cache: 4096K

CPU: Physical Processor ID: 0

CPU: Processor Core ID: 3

CPU: After all inits, caps: bfebfbff 20100000 00000000 00003940 0004e33d 00000000 00000001

Intel machine check architecture supported.

Intel machine check reporting enabled on CPU#3.

CPU3: Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07

Total of 4 processors activated (15962.35 BogoMIPS).

ENABLING IO-APIC IRQs

..TIMER: vector=0x31 apic1=0 pin1=2 apic2=-1 pin2=-1

checking TSC synchronization [CPU#0 -> CPU#1]: passed.

checking TSC synchronization [CPU#0 -> CPU#2]: passed.

checking TSC synchronization [CPU#0 -> CPU#3]: passed.

Brought up 4 CPUs

migration_cost=27,2604

NET: Registered protocol family 16

ACPI: bus type pci registered

PCI: Using MMCONFIG

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Setting up standard PCI resources

ACPI: Interpreter enabled

ACPI: (supports S0 S4 S5)

ACPI: Using IOAPIC for interrupt routing

ACPI: PCI Root Bridge [PCI0] (0000:00)

PCI: Dell PowerEdge 1950 detected, enabling pci=bfsort.

PCI: Probing PCI hardware (bus 00)

PCI: PXH quirk detected, disabling MSI for SHPC device

Boot video device is 0000:0f:0d.0

PCI: Transparent bridge – 0000:00:1e.0

ACPI: PCI Interrupt Routing Table [_SB_.PCI0._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2.UPST._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2.UPST.DWN1._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2.UPST.DWN2._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX3._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX3.PE2P._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX4._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX6._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.SBEX._PRT]

ACPI: PCI Interrupt Routing Table [_SB_.PCI0.COMP._PRT]

ACPI: PCI Interrupt Link [LK00] (IRQs 3 4 5 6 7 10 *11 12)

ACPI: PCI Interrupt Link [LK01] (IRQs 3 4 5 6 7 10 *11 12)

ACPI: PCI Interrupt Link [LK02] (IRQs 3 4 5 6 7 10 11 12) *0, disabled.

ACPI: PCI Interrupt Link [LK03] (IRQs 3 4 5 6 7 *10 11 12)

ACPI: PCI Interrupt Link [LK04] (IRQs 3 4 5 *6 7 10 11 12)

ACPI: PCI Interrupt Link [LK05] (IRQs 3 4 5 6 7 *10 11 12)

ACPI: PCI Interrupt Link [LK06] (IRQs 3 4 5 6 7 10 11 12) *0, disabled.

ACPI: PCI Interrupt Link [LK07] (IRQs 3 4 *5 6 7 10 11 12)

Linux Plug and Play Support v0.97 (c) Adam Belay

pnp: PnP ACPI init

pnp: PnP ACPI: found 12 devices

SCSI subsystem initialized

libata version 2.20 loaded.

usbcore: registered new interface driver usbfs

usbcore: registered new interface driver hub

usbcore: registered new device driver usb

PCI: Using ACPI for IRQ routing

PCI: If a device doesn't work, try "pci=routeirq". If it helps, post a report

pnp: 00:08: ioport range 0x800–0x87f has been reserved

pnp: 00:08: ioport range 0x880–0x8bf has been reserved

pnp: 00:08: ioport range 0x8c0–0x8df has been reserved

pnp: 00:08: ioport range 0x8e0–0x8e3 has been reserved

pnp: 00:08: ioport range 0xc00–0xc7f has been reserved

pnp: 00:08: ioport range 0xca0–0xca7 has been reserved

Time: tsc clocksource has been installed.

Switched to high resolution mode on CPU 0

pnp: 00:08: ioport range 0xca9–0xcab has been reserved

Switched to high resolution mode on CPU 1

Switched to high resolution mode on CPU 2

pnp: 00:08: ioport range 0xcad–0xcaf has been reserved

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Switched to high resolution mode on CPU 3
pnp: 00:09: ioport range 0xca8-0xca8 has been reserved
pnp: 00:09: ioport range 0xcac-0xcac has been reserved
pnp: 00:0a: iomem range 0xe0000000-0xffffffff could not be reserved
PCI: Bridge: 0000:07:00.0
IO window: disabled.
MEM window: f4000000-f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:06:00.0
IO window: disabled.
MEM window: f4000000-f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:06:01.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:05:00.0
IO window: disabled.
MEM window: f4000000-f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:05:00.3
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:02.0
IO window: disabled.
MEM window: f2000000-f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:01:00.0
IO window: e000-efff
MEM window: fc400000-fc5fffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:03.0
IO window: e000-efff
MEM window: fc300000-fc5fffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:04.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:05.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:06.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:07.0
IO window: disabled.
MEM window: disabled.

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PREFETCH window: disabled.
PCI: Bridge: 0000:03:00.0
IO window: disabled.
MEM window: f8000000–fbffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:1c.0
IO window: disabled.
MEM window: f8000000–fbffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:1e.0
IO window: d000–dfff
MEM window: fc100000–fc2fffff
PREFETCH window: d8000000–dfffffff
ACPI: PCI Interrupt 0000:00:02.0[A] -> GSI 17 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:00:02.0 to 64
ACPI: PCI Interrupt 0000:05:00.0[A] -> GSI 17 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:05:00.0 to 64
ACPI: PCI Interrupt 0000:06:00.0[A] -> GSI 17 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:06:00.0 to 64
PCI: Setting latency timer of device 0000:07:00.0 to 64
ACPI: PCI Interrupt 0000:06:01.0[A] -> GSI 17 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:06:01.0 to 64
PCI: Setting latency timer of device 0000:05:00.3 to 64
ACPI: PCI Interrupt 0000:00:03.0[A] -> GSI 16 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:00:03.0 to 64
PCI: Setting latency timer of device 0000:01:00.0 to 64
ACPI: PCI Interrupt 0000:00:04.0[A] -> GSI 18 (level, low) -> IRQ 18
PCI: Setting latency timer of device 0000:00:04.0 to 64
PCI: Setting latency timer of device 0000:00:05.0 to 64
ACPI: PCI Interrupt 0000:00:06.0[A] -> GSI 19 (level, low) -> IRQ 19
PCI: Setting latency timer of device 0000:00:06.0 to 64
PCI: Setting latency timer of device 0000:00:07.0 to 64
ACPI: PCI Interrupt 0000:00:1c.0[A] -> GSI 16 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:00:1c.0 to 64
PCI: Setting latency timer of device 0000:03:00.0 to 64
PCI: Setting latency timer of device 0000:00:1e.0 to 64
NET: Registered protocol family 2
IP route cache hash table entries: 32768 (order: 5, 131072 bytes)
TCP established hash table entries: 131072 (order: 9, 2097152 bytes)
TCP bind hash table entries: 65536 (order: 7, 786432 bytes)
TCP: Hash tables configured (established 131072 bind 65536)
TCP reno registered
Machine check exception polling timer started.
IA-32 Microcode Update Driver: v1.14a <tigran@xxxxxxxxxxxxxxxxxxxxxx>
highmem bounce pool size: 64 pages
Total HugeTLB memory allocated, 0
io scheduler noop registered
io scheduler anticipatory registered
io scheduler deadline registered (default)
io scheduler cfq registered
PCI: Setting latency timer of device 0000:00:02.0 to 64

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assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:02.0:pcie00]
Allocate Port Service[0000:00:02.0:pcie01]
PCI: Setting latency timer of device 0000:00:03.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:03.0:pcie00]
Allocate Port Service[0000:00:03.0:pcie01]
PCI: Setting latency timer of device 0000:00:04.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:04.0:pcie00]
Allocate Port Service[0000:00:04.0:pcie01]
PCI: Setting latency timer of device 0000:00:05.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:05.0:pcie00]
Allocate Port Service[0000:00:05.0:pcie01]
PCI: Setting latency timer of device 0000:00:06.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:06.0:pcie00]
Allocate Port Service[0000:00:06.0:pcie01]
PCI: Setting latency timer of device 0000:00:07.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:07.0:pcie00]
Allocate Port Service[0000:00:07.0:pcie01]
PCI: Setting latency timer of device 0000:00:1c.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:1c.0:pcie00]
Allocate Port Service[0000:00:1c.0:pcie03]
PCI: Setting latency timer of device 0000:05:00.0 to 64
Allocate Port Service[0000:05:00.0:pcie10]
Allocate Port Service[0000:05:00.0:pcie11]
PCI: Setting latency timer of device 0000:06:00.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:06:00.0:pcie20]
Allocate Port Service[0000:06:00.0:pcie21]
PCI: Setting latency timer of device 0000:06:01.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:06:01.0:pcie20]
Allocate Port Service[0000:06:01.0:pcie21]
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:02.0:pcie01 failed with error 2
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:03.0:pcie01 failed with error 2
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:04.0:pcie01 failed with error 2
aer_init: AER service init fails – No ACPI _OSC support

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```
aer: probe of 0000:00:05.0:pcie01 failed with error 1
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:06.0:pcie01 failed with error 2
aer_init: AER service init fails – No ACPI _OSC support
aer: probe of 0000:00:07.0:pcie01 failed with error 1
input: Power Button (FF) as /class/input/input0
ACPI: Power Button (FF) [PWRBF]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
Real Time Clock Driver v1.12ac
hpet_resources: 0xfed00000 is busy
intel_rng: FWH not detected
ipmi message handler version 39.1
ipmi device interface
IPMI System Interface driver.
ipmi_si: Trying SMBIOS-specified kcs state machine at i/o address 0xca8, slave address 0x20, irq 0
ipmi: Found new BMC (man_id: 0x0002a2, prod_id: 0x0100, dev_id: 0x20)
IPMI kcs interface initialized
IPMI Watchdog: driver initialized
Copyright (C) 2004 MontaVista Software – IPMI Powerdown via sys_reboot.
IPMI poweroff: ATCA Detect mfg 0x2A2 prod 0x100
IPMI poweroff: Found a chassis style poweroff function
Hangcheck: starting hangcheck timer 0.9.0 (tick is 180 seconds, margin is 60 seconds).
Hangcheck: Using get_cycles().
Serial: 8250/16550 driver $Revision: 1.90 $ 4 ports, IRQ sharing disabled
serial8250: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
serial8250: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
00:06: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
00:07: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
floppy0: no floppy controllers found
loop: loaded (max 8 devices)
Ethernet Channel Bonding Driver: v3.1.2 (January 20, 2007)
bonding: Warning: either miimon or arp_interval and arp_ip_target module parameters must be specified,
otherwise bonding will not detect link failures! see bonding.txt for details.
Broadcom NetXtreme II Gigabit Ethernet Driver bnx2 v1.5.8.1 (May 7, 2007)
ACPI: PCI Interrupt 0000:04:00.0[A] -> GSI 16 (level, low) -> IRQ 17
eth0: Broadcom NetXtreme II BCM5708 1000Base-T (B2) PCI-X 64-bit 133MHz found at mem f8000000,
IRQ 17, node addr 0019b9e2a6e9
ACPI: PCI Interrupt 0000:08:00.0[A] -> GSI 17 (level, low) -> IRQ 16
eth1: Broadcom NetXtreme II BCM5708 1000Base-T (B2) PCI-X 64-bit 133MHz found at mem f4000000,
IRQ 16, node addr 0019b9e2a6eb
netconsole: not configured, aborting
st: Version 20070203, fixed bufsize 32768, s/g segs 256
ata_piix 0000:00:1f.1: version 2.10ac1
ACPI: PCI Interrupt 0000:00:1f.1[A] -> GSI 16 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:00:1f.1 to 64
ata1: PATA max UDMA/100 cmd 0x000101f0 ctl 0x000103f6 bmdma 0x0001fc00 irq 14
```

IRQ handling difference between i386 and x86_64

ata2: PATA max UDMA/100 cmd 0x00010170 ctl 0x00010376 bmdma 0x0001fc08 irq 15
scsi0 : ata_piix
ata1.00: ATAPI, max UDMA/33
ata1.00: configured for UDMA/33
scsi1 : ata_piix
ata2: port disabled. ignoring.
scsi 0:0:0:0: CD-ROM SONY DVD-ROM DDU810A KD38 PQ: 0 ANSI: 5
sr0: scsi3-mmc drive: 24x/24x cd/rw xa/form2 cdda tray
Uniform CD-ROM driver Revision: 3.20
sr 0:0:0:0: Attached scsi CD-ROM sr0
sr 0:0:0:0: Attached scsi generic sg0 type 5
ata_piix 0000:00:1f.2: MAP [P0 P2 P1 P3]
ACPI: PCI Interrupt 0000:00:1f.2[C] -> GSI 23 (level, low) -> IRQ 20
PCI: Setting latency timer of device 0000:00:1f.2 to 64
ata3: SATA max UDMA/133 cmd 0x0001cc98 ctl 0x0001cc92 bmdma 0x0001cc60 irq 20
ata4: SATA max UDMA/133 cmd 0x0001cc80 ctl 0x0001cc7a bmdma 0x0001cc68 irq 20
scsi2 : ata_piix
ATA: abnormal status 0x7F on port 0x0001cc9f
scsi3 : ata_piix
ATA: abnormal status 0x7F on port 0x0001cc87
Fusion MPT base driver 3.04.04
Copyright (c) 1999-2007 LSI Logic Corporation
Fusion MPT SPI Host driver 3.04.04
Fusion MPT FC Host driver 3.04.04
Fusion MPT SAS Host driver 3.04.04
ACPI: PCI Interrupt 0000:02:08.0[A] -> GSI 64 (level, low) -> IRQ 21
mptbase: Initiating ioc0 bringup
ioc0: SAS1068: Capabilities={Initiator}
scsi4 : ioc0: LSISAS1068, FwRev=000a3100h, Ports=1, MaxQ=366, IRQ=21
scsi 4:0:0:0: Direct-Access ATA ST3500630NS E PQ: 0 ANSI: 5
SCSI device sda: 976773168 512-byte hdwr sectors (500108 MB)
sda: Write Protect is off
sda: Mode Sense: 73 00 00 08
SCSI device sda: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
SCSI device sda: 976773168 512-byte hdwr sectors (500108 MB)
sda: Write Protect is off
sda: Mode Sense: 73 00 00 08
SCSI device sda: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
sda: sda1 sda2 sda3 sda4
sd 4:0:0:0: Attached scsi disk sda
sd 4:0:0:0: Attached scsi generic sg1 type 0
scsi 4:0:1:0: Direct-Access ATA ST3500630NS E PQ: 0 ANSI: 5
SCSI device sdb: 976773168 512-byte hdwr sectors (500108 MB)
sdb: Write Protect is off
sdb: Mode Sense: 73 00 00 08
SCSI device sdb: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
SCSI device sdb: 976773168 512-byte hdwr sectors (500108 MB)
sdb: Write Protect is off
sdb: Mode Sense: 73 00 00 08
SCSI device sdb: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
sdb: sdb1 sdb2 sdb3 sdb4

IRQ handling difference between i386 and x86_64

```
sd 4:0:1:0: Attached scsi disk sdb
sd 4:0:1:0: Attached scsi generic sg2 type 0
Fusion MPT misc device (ioctl) driver 3.04.04
mptctl: Registered with Fusion MPT base driver
mptctl: /dev/mptctl @ (major,minor=10,220)
ACPI: PCI Interrupt 0000:00:1d.7[A] -> GSI 21 (level, low) -> IRQ 22
PCI: Setting latency timer of device 0000:00:1d.7 to 64
ehci_hcd 0000:00:1d.7: EHCI Host Controller
ehci_hcd 0000:00:1d.7: new USB bus registered, assigned bus number 1
ehci_hcd 0000:00:1d.7: debug port 1
PCI: cache line size of 32 is not supported by device 0000:00:1d.7
ehci_hcd 0000:00:1d.7: irq 22, io mem 0xfc600400
ehci_hcd 0000:00:1d.7: USB 2.0 started, EHCI 1.00, driver 10 Dec 2004
usb usb1: configuration #1 chosen from 1 choice
hub 1-0:1.0: USB hub found
hub 1-0:1.0: 6 ports detected
USB Universal Host Controller Interface driver v3.0
ACPI: PCI Interrupt 0000:00:1d.0[A] -> GSI 21 (level, low) -> IRQ 22
PCI: Setting latency timer of device 0000:00:1d.0 to 64
uhci_hcd 0000:00:1d.0: UHCI Host Controller
uhci_hcd 0000:00:1d.0: new USB bus registered, assigned bus number 2
uhci_hcd 0000:00:1d.0: irq 22, io base 0x0000cce0
usb usb2: configuration #1 chosen from 1 choice
hub 2-0:1.0: USB hub found
hub 2-0:1.0: 2 ports detected
ACPI: PCI Interrupt 0000:00:1d.1[B] -> GSI 20 (level, low) -> IRQ 23
PCI: Setting latency timer of device 0000:00:1d.1 to 64
uhci_hcd 0000:00:1d.1: UHCI Host Controller
uhci_hcd 0000:00:1d.1: new USB bus registered, assigned bus number 3
uhci_hcd 0000:00:1d.1: irq 23, io base 0x0000ccc0
usb usb3: configuration #1 chosen from 1 choice
hub 3-0:1.0: USB hub found
hub 3-0:1.0: 2 ports detected
ACPI: PCI Interrupt 0000:00:1d.2[C] -> GSI 21 (level, low) -> IRQ 22
PCI: Setting latency timer of device 0000:00:1d.2 to 64
uhci_hcd 0000:00:1d.2: UHCI Host Controller
uhci_hcd 0000:00:1d.2: new USB bus registered, assigned bus number 4
uhci_hcd 0000:00:1d.2: irq 22, io base 0x0000cca0
usb usb4: configuration #1 chosen from 1 choice
hub 4-0:1.0: USB hub found
hub 4-0:1.0: 2 ports detected
usb 1-5: new high speed USB device using ehci_hcd and address 3
usb 1-5: configuration #1 chosen from 1 choice
hub 1-5:1.0: USB hub found
hub 1-5:1.0: 4 ports detected
usb 3-1: new low speed USB device using uhci_hcd and address 2
usb 3-1: configuration #1 chosen from 1 choice
input: USB Keyboard as /class/input/input1
input: USB HID v1.10 Keyboard [ USB Keyboard] on usb-0000:00:1d.1-1
input: USB Keyboard as /class/input/input2
input: USB HID v1.10 Device [ USB Keyboard] on usb-0000:00:1d.1-1
```

IRQ handling difference between i386 and x86_64

```
usbcore: registered new interface driver usbhid
drivers/usb/input/hid-core.c: v2.6:USB HID core driver
PNP: No PS/2 controller found. Probing ports directly.
serio: i8042 KBD port at 0x60,0x64 irq 1
serio: i8042 AUX port at 0x60,0x64 irq 12
mice: PS/2 mouse device common for all mice
md: raid1 personality registered for level 1
raid6: int32x1 722 MB/s
raid6: int32x2 750 MB/s
raid6: int32x4 675 MB/s
raid6: int32x8 582 MB/s
raid6: mmxx1 2136 MB/s
raid6: mmxx2 2593 MB/s
raid6: sse1x1 1492 MB/s
raid6: sse1x2 2535 MB/s
raid6: sse2x1 2667 MB/s
raid6: sse2x2 4976 MB/s
raid6: using algorithm sse2x2 (4976 MB/s)
md: raid6 personality registered for level 6
md: raid5 personality registered for level 5
md: raid4 personality registered for level 4
raid5: automatically using best checksumming function: pIII_sse
pIII_sse : 6880.000 MB/sec
raid5: using function: pIII_sse (6880.000 MB/sec)
device-mapper: ioctl: 4.11.0-ioctl (2006-10-12) initialised: dm-devel@xxxxxxxxxxx
device-mapper: multipath: version 1.0.5 loaded
device-mapper: multipath round-robin: version 1.0.0 loaded
EDAC MC: Ver: 2.0.1 Jun 29 2007
dcdbas dcdbas: Dell Systems Management Base Driver (version 5.6.0-3.2)
ACPI: PCI Interrupt 0000:00:08.0[A] -> GSI 16 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:00:08.0 to 64
Intel(R) I/OAT DMA Engine found, 4 channels
Netfilter messages via NETLINK v0.30.
ip_tables: (C) 2000-2006 Netfilter Core Team
arp_tables: (C) 2002 David S. Miller
TCP cubic registered
NET: Registered protocol family 1
NET: Registered protocol family 10
ip6_tables: (C) 2000-2006 Netfilter Core Team
IPv6 over IPv4 tunneling driver
NET: Registered protocol family 17
Using IPI No-Shortcut mode
BIOS EDD facility v0.16 2004-Jun-25, 2 devices found
md: Autodetecting RAID arrays.
md: autorun ...
md: considering sdb4 ...
md: adding sdb4 ...
md: sdb3 has different UUID to sdb4
md: sdb2 has different UUID to sdb4
md: adding sda4 ...
md: sda3 has different UUID to sdb4
```

IRQ handling difference between i386 and x86_64

```
md: sda2 has different UUID to sdb4
md: created md1
md: bind<sda4>
md: bind<sdb4>
md: running: <sdb4><sda4>
raid1: raid set md1 active with 2 out of 2 mirrors
md: considering sdb3 ...
md: adding sdb3 ...
md: sdb2 has different UUID to sdb3
md: adding sda3 ...
md: sda2 has different UUID to sdb3
md: created md15
md: bind<sda3>
md: bind<sdb3>
md: running: <sdb3><sda3>
raid1: raid set md15 active with 2 out of 2 mirrors
md: considering sdb2 ...
md: adding sdb2 ...
md: adding sda2 ...
md: created md0
md: bind<sda2>
md: bind<sdb2>
md: running: <sdb2><sda2>
raid1: raid set md0 active with 2 out of 2 mirrors
md: ... autorun DONE.
kjournald starting. Commit interval 5 seconds
EXT3-fs: mounted filesystem with journal data mode.
VFS: Mounted root (ext3 filesystem) readonly.
Freeing unused kernel memory: 200k freed
EXT3 FS on md0, internal journal
kjournald starting. Commit interval 5 seconds
EXT3 FS on dm-0, internal journal
EXT3-fs: mounted filesystem with journal data mode.
kjournald starting. Commit interval 5 seconds
EXT3 FS on dm-1, internal journal
EXT3-fs: mounted filesystem with journal data mode.
Adding 8000248k swap on /dev/md15. Priority:8192 extents:1 across:8000248k
bonding: bond0: setting mode to active-backup (1).
bonding: bond0: Setting MII monitoring interval to 100.
ADDRCONF(NETDEV_UP): bond0: link is not ready
bonding: bond0: Adding slave eth0.
bnx2: eth0: using MSI
ADDRCONF(NETDEV_UP): eth0: link is not ready
bonding: bond0: enslaving eth0 as a backup interface with a down link.
bonding: bond0: Adding slave eth1.
bnx2: eth1: using MSI
ADDRCONF(NETDEV_UP): eth1: link is not ready
bonding: bond0: enslaving eth1 as a backup interface with a down link.
bonding: bond0: Setting eth1 as primary slave.
bnx2: eth0 NIC Link is Up, 1000 Mbps full duplex, receive & transmit flow control ON
ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
```

IRQ handling difference between i386 and x86_64

```
bonding: bond0: link status definitely up for interface eth0.
bonding: bond0: making interface eth0 the new active one.
bonding: bond0: first active interface up!
ADDRCONF(NETDEV_CHANGE): bond0: link becomes ready
eth0: no IPv6 routers present
bond0: no IPv6 routers present
process `sysctl' is using deprecated sysctl (syscall) net.ipv6.neigh.default.retrans_time; Use
net.ipv6.neigh.default.retrans_time_ms instead.
Linux version 2.6.21.5-64 (root@fish1) (gcc version 4.1.2 (Gentoo 4.1.2)) #3 SMP PREEMPT Fri Jun 29
00:09:17 CEST 2007
Command line: auto BOOT_IMAGE=Lin64-2.6.21.5 ro root=900 rootflags=data=journal
BIOS-provided physical RAM map:
BIOS-e820: 0000000000000000 - 00000000000a0000 (usable)
BIOS-e820: 0000000000100000 - 00000000cffa8000 (usable)
BIOS-e820: 00000000cffa8000 - 00000000cffb7c00 (ACPI data)
BIOS-e820: 00000000cffb7c00 - 00000000d0000000 (reserved)
BIOS-e820: 00000000e0000000 - 00000000f0000000 (reserved)
BIOS-e820: 00000000fe000000 - 0000000100000000 (reserved)
BIOS-e820: 0000000100000000 - 0000000130000000 (usable)
Entering add_active_range(0, 0, 160) 0 entries of 256 used
Entering add_active_range(0, 256, 851880) 1 entries of 256 used
Entering add_active_range(0, 1048576, 1245184) 2 entries of 256 used
end_pfn_map = 1245184
DMI 2.4 present.
ACPI: RSDP 000F2620, 0024 (r2 DELL )
ACPI: XSDT 000F26A0, 004C (r1 DELL PE_SC3 1 DELL 1)
ACPI: FACP 000F27A8, 00F4 (r3 DELL PE_SC3 1 DELL 1)
ACPI: DSDT CFFA8000, 3C53 (r1 DELL PE_SC3 1 MSFT 100000E)
ACPI: FACS CFFB7C00, 0040
ACPI: APIC 000F289C, 00C8 (r1 DELL PE_SC3 1 DELL 1)
ACPI: SPCR 000F297D, 0050 (r1 DELL PE_SC3 1 DELL 1)
ACPI: HPET 000F29CD, 0038 (r1 DELL PE_SC3 1 DELL 1)
ACPI: MCFG 000F2A05, 003C (r1 DELL PE_SC3 1 DELL 1)
Entering add_active_range(0, 0, 160) 0 entries of 256 used
Entering add_active_range(0, 256, 851880) 1 entries of 256 used
Entering add_active_range(0, 1048576, 1245184) 2 entries of 256 used
Zone PFN ranges:
DMA 0 -> 4096
DMA32 4096 -> 1048576
Normal 1048576 -> 1245184
early_node_map[3] active PFN ranges
0: 0 -> 160
0: 256 -> 851880
0: 1048576 -> 1245184
On node 0 totalpages: 1048392
DMA zone: 56 pages used for memmap
DMA zone: 1367 pages reserved
DMA zone: 2577 pages, LIFO batch:0
DMA32 zone: 14280 pages used for memmap
DMA32 zone: 833504 pages, LIFO batch:31
Normal zone: 2688 pages used for memmap
```

IRQ handling difference between i386 and x86_64

Normal zone: 193920 pages, LIFO batch:31
ACPI: PM-Timer IO Port: 0x808
ACPI: Local APIC address 0xfe00000
ACPI: LAPIC (acpi_id[0x01] lapic_id[0x00] enabled)
Processor #0 (Bootup-CPU)
ACPI: LAPIC (acpi_id[0x02] lapic_id[0x01] enabled)
Processor #1
ACPI: LAPIC (acpi_id[0x03] lapic_id[0x02] enabled)
Processor #2
ACPI: LAPIC (acpi_id[0x04] lapic_id[0x03] enabled)
Processor #3
ACPI: LAPIC (acpi_id[0x05] lapic_id[0x14] disabled)
ACPI: LAPIC (acpi_id[0x06] lapic_id[0x15] disabled)
ACPI: LAPIC (acpi_id[0x07] lapic_id[0x16] disabled)
ACPI: LAPIC (acpi_id[0x08] lapic_id[0x17] disabled)
ACPI: LAPIC_NMI (acpi_id[0x01] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x02] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x03] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x04] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x05] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x06] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x07] high edge lint[0x1])
ACPI: LAPIC_NMI (acpi_id[0x08] high edge lint[0x1])
ACPI: IOAPIC (id[0x04] address[0xfec00000] gsi_base[0])
IOAPIC[0]: apic_id 4, address 0xfec00000, GSI 0-23
ACPI: IOAPIC (id[0x05] address[0xfec81000] gsi_base[64])
IOAPIC[1]: apic_id 5, address 0xfec81000, GSI 64-87
ACPI: INT_SRC_OVR (bus 0 bus_irq 0 global_irq 2 dfl dfl)
ACPI: INT_SRC_OVR (bus 0 bus_irq 9 global_irq 9 high level)
ACPI: IRQ0 used by override.
ACPI: IRQ2 used by override.
ACPI: IRQ9 used by override.
Setting APIC routing to physical flat
ACPI: HPET id: 0x8086a201 base: 0xfed00000
Using ACPI (MADT) for SMP configuration information
Nosave address range: 0000000000a0000 - 000000000100000
Nosave address range: 00000000cfa8000 - 00000000cfeb7000
Nosave address range: 00000000cfeb7000 - 00000000cfeb8000
Nosave address range: 00000000cfeb8000 - 00000000d0000000
Nosave address range: 00000000d0000000 - 00000000e0000000
Nosave address range: 00000000e0000000 - 00000000f0000000
Nosave address range: 00000000f0000000 - 00000000fe000000
Nosave address range: 00000000fe000000 - 0000000100000000
Allocating PCI resources starting at d1000000 (gap: d0000000:10000000)
SMP: Allowing 4 CPUs, 0 hotplug CPUs
PERCPU: Allocating 24384 bytes of per cpu data
Built 1 zonelists. Total pages: 1030001
Kernel command line: auto BOOT_IMAGE=Lin64-2.6.21.5 ro root=900 rootflags=data=journal
Initializing CPU#0
PID hash table entries: 4096 (order: 12, 32768 bytes)
Extended CMOS year: 2000

IRQ handling difference between i386 and x86_64

time.c: Detected 1994.999 MHz processor.
Console: colour VGA+ 80x30
Dentry cache hash table entries: 524288 (order: 10, 4194304 bytes)
Inode-cache hash table entries: 262144 (order: 9, 2097152 bytes)
Checking aperture...
PCI-DMA: Using software bounce buffering for IO (SWIOTLB)
Placing software IO TLB between 0x58d4000 - 0x98d4000
Memory: 4047360k/4980736k available (3126k kernel code, 146000k reserved, 1501k data, 220k init)
Calibrating delay using timer specific routine.. 3992.36 BogoMIPS (lpj=1996180)
Mount-cache hash table entries: 256
CPU: L1 I cache: 32K, L1 D cache: 32K
CPU: L2 cache: 4096K
using mwait in idle threads.
CPU: Physical Processor ID: 0
CPU: Processor Core ID: 0
CPU0: Thermal monitoring enabled (TM1)
SMP alternatives: switching to UP code
ACPI: Core revision 20070126
Using local APIC timer interrupts.
result 20781239
Detected 20.781 MHz APIC timer.
SMP alternatives: switching to SMP code
Booting processor 1/4 APIC 0x1
Initializing CPU#1
Calibrating delay using timer specific routine.. 3990.00 BogoMIPS (lpj=1995001)
CPU: L1 I cache: 32K, L1 D cache: 32K
CPU: L2 cache: 4096K
CPU: Physical Processor ID: 0
CPU: Processor Core ID: 1
CPU1: Thermal monitoring enabled (TM2)
Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07
checking TSC synchronization [CPU#0 -> CPU#1]: passed.
SMP alternatives: switching to SMP code
Booting processor 2/4 APIC 0x2
Initializing CPU#2
Calibrating delay using timer specific routine.. 3990.02 BogoMIPS (lpj=1995011)
CPU: L1 I cache: 32K, L1 D cache: 32K
CPU: L2 cache: 4096K
CPU: Physical Processor ID: 0
CPU: Processor Core ID: 2
CPU2: Thermal monitoring enabled (TM2)
Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07
checking TSC synchronization [CPU#0 -> CPU#2]: passed.
SMP alternatives: switching to SMP code
Booting processor 3/4 APIC 0x3
Initializing CPU#3
Calibrating delay using timer specific routine.. 3990.01 BogoMIPS (lpj=1995007)
CPU: L1 I cache: 32K, L1 D cache: 32K
CPU: L2 cache: 4096K
CPU: Physical Processor ID: 0
CPU: Processor Core ID: 3

IRQ handling difference between i386 and x86_64

CPU3: Thermal monitoring enabled (TM2)
Intel(R) Xeon(R) CPU E5335 @ 2.00GHz stepping 07
checking TSC synchronization [CPU#0 -> CPU#3]: passed.
Brought up 4 CPUs
migration_cost=20,2604
NET: Registered protocol family 16
ACPI: bus type pci registered
PCI: Using MMCONFIG at e0000000 - effffff
ACPI: Interpreter enabled
ACPI: (supports S0 S4 S5)
ACPI: Using IOAPIC for interrupt routing
ACPI: PCI Root Bridge [PCI0] (0000:00)
PCI: Dell PowerEdge 1950 detected, enabling pci=bfsort.
PCI: Probing PCI hardware (bus 00)
PCI: PXH quirk detected, disabling MSI for SHPC device
Boot video device is 0000:0f:0d.0
PCI: Transparent bridge - 0000:00:1e.0
ACPI: PCI Interrupt Routing Table [_SB_.PCI0._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2.UPST._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2.UPST.DWN1._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX2.UPST.DWN2._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX3._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX3.PE2P._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX4._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX6._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.SBEX._PRT]
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.COMP._PRT]
ACPI: PCI Interrupt Link [LK00] (IRQs 3 4 5 6 7 10 *11 12)
ACPI: PCI Interrupt Link [LK01] (IRQs 3 4 5 6 7 10 *11 12)
ACPI: PCI Interrupt Link [LK02] (IRQs 3 4 5 6 7 10 11 12) *0, disabled.
ACPI: PCI Interrupt Link [LK03] (IRQs 3 4 5 6 7 *10 11 12)
ACPI: PCI Interrupt Link [LK04] (IRQs 3 4 5 *6 7 10 11 12)
ACPI: PCI Interrupt Link [LK05] (IRQs 3 4 5 6 7 *10 11 12)
ACPI: PCI Interrupt Link [LK06] (IRQs 3 4 5 6 7 10 11 12) *0, disabled.
ACPI: PCI Interrupt Link [LK07] (IRQs 3 4 *5 6 7 10 11 12)
Linux Plug and Play Support v0.97 (c) Adam Belay
pnp: PnP ACPI init
pnp: PnP ACPI: found 12 devices
SCSI subsystem initialized
libata version 2.20 loaded.
usbcore: registered new interface driver usbfs
usbcore: registered new interface driver hub
usbcore: registered new device driver usb
PCI: Using ACPI for IRQ routing
PCI: If a device doesn't work, try "pci=routeirq". If it helps, post a report
PCI-GART: No AMD northbridge found.
hpet0: at MMIO 0xfed00000, IRQs 2, 8, 0
hpet0: 3 64-bit timers, 14318180 Hz
pnp: 00:08: ioport range 0x800-0x87f has been reserved
Time: tsc clocksource has been installed.

IRQ handling difference between i386 and x86_64

pnP: 00:08: ioport range 0x880–0x8bf has been reserved
pnP: 00:08: ioport range 0x8c0–0x8df has been reserved
pnP: 00:08: ioport range 0x8e0–0x8e3 has been reserved
pnP: 00:08: ioport range 0xc00–0xc7f has been reserved
pnP: 00:08: ioport range 0xca0–0xca7 has been reserved
pnP: 00:08: ioport range 0xca9–0xcab has been reserved
pnP: 00:08: ioport range 0xcad–0xcaf has been reserved
pnP: 00:09: ioport range 0xca8–0xca8 has been reserved
pnP: 00:09: ioport range 0xcac–0xcac has been reserved
pnP: 00:0a: iomem range 0xe0000000–0xffffffff could not be reserved
PCI: Bridge: 0000:07:00.0
IO window: disabled.
MEM window: f4000000–f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:06:00.0
IO window: disabled.
MEM window: f4000000–f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:06:01.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:05:00.0
IO window: disabled.
MEM window: f4000000–f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:05:00.3
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:02.0
IO window: disabled.
MEM window: f2000000–f7ffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:01:00.0
IO window: e000–efff
MEM window: fc400000–fc5fffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:03.0
IO window: e000–efff
MEM window: fc300000–fc5fffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:04.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:05.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:06.0

IRQ handling difference between i386 and x86_64

IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:00:07.0
IO window: disabled.
MEM window: disabled.
PREFETCH window: disabled.
PCI: Bridge: 0000:03:00.0
IO window: disabled.
MEM window: f8000000–fbffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:1c.0
IO window: disabled.
MEM window: f8000000–fbffffff
PREFETCH window: disabled.
PCI: Bridge: 0000:00:1e.0
IO window: d000–dfff
MEM window: fc100000–fc2ffffff
PREFETCH window: d8000000–dfffffff
ACPI: PCI Interrupt 0000:00:02.0[A] -> GSI 17 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:00:02.0 to 64
ACPI: PCI Interrupt 0000:05:00.0[A] -> GSI 17 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:05:00.0 to 64
ACPI: PCI Interrupt 0000:06:00.0[A] -> GSI 17 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:06:00.0 to 64
PCI: Setting latency timer of device 0000:07:00.0 to 64
ACPI: PCI Interrupt 0000:06:01.0[A] -> GSI 17 (level, low) -> IRQ 17
PCI: Setting latency timer of device 0000:06:01.0 to 64
PCI: Setting latency timer of device 0000:05:00.3 to 64
ACPI: PCI Interrupt 0000:00:03.0[A] -> GSI 16 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:00:03.0 to 64
PCI: Setting latency timer of device 0000:01:00.0 to 64
ACPI: PCI Interrupt 0000:00:04.0[A] -> GSI 18 (level, low) -> IRQ 18
PCI: Setting latency timer of device 0000:00:04.0 to 64
PCI: Setting latency timer of device 0000:00:05.0 to 64
ACPI: PCI Interrupt 0000:00:06.0[A] -> GSI 19 (level, low) -> IRQ 19
PCI: Setting latency timer of device 0000:00:06.0 to 64
PCI: Setting latency timer of device 0000:00:07.0 to 64
ACPI: PCI Interrupt 0000:00:1c.0[A] -> GSI 16 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:00:1c.0 to 64
PCI: Setting latency timer of device 0000:03:00.0 to 64
PCI: Setting latency timer of device 0000:00:1e.0 to 64
NET: Registered protocol family 2
IP route cache hash table entries: 131072 (order: 8, 1048576 bytes)
TCP established hash table entries: 131072 (order: 9, 3145728 bytes)
TCP bind hash table entries: 65536 (order: 8, 1048576 bytes)
TCP: Hash tables configured (established 131072 bind 65536)
TCP reno registered
IA-32 Microcode Update Driver: v1.14a <tigran@xxxxxxxxxxxxxxxxxxxx>
Total HugeTLB memory allocated, 0
io scheduler noop registered

IRQ handling difference between i386 and x86_64

io scheduler anticipatory registered
io scheduler deadline registered (default)
io scheduler cfq registered
PCI: Setting latency timer of device 0000:00:02.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:02.0:pcie00]
Allocate Port Service[0000:00:02.0:pcie01]
PCI: Setting latency timer of device 0000:00:03.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:03.0:pcie00]
Allocate Port Service[0000:00:03.0:pcie01]
PCI: Setting latency timer of device 0000:00:04.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:04.0:pcie00]
Allocate Port Service[0000:00:04.0:pcie01]
PCI: Setting latency timer of device 0000:00:05.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:05.0:pcie00]
Allocate Port Service[0000:00:05.0:pcie01]
PCI: Setting latency timer of device 0000:00:06.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:06.0:pcie00]
Allocate Port Service[0000:00:06.0:pcie01]
PCI: Setting latency timer of device 0000:00:07.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:07.0:pcie00]
Allocate Port Service[0000:00:07.0:pcie01]
PCI: Setting latency timer of device 0000:00:1c.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:00:1c.0:pcie00]
Allocate Port Service[0000:00:1c.0:pcie03]
PCI: Setting latency timer of device 0000:05:00.0 to 64
Allocate Port Service[0000:05:00.0:pcie10]
Allocate Port Service[0000:05:00.0:pcie11]
PCI: Setting latency timer of device 0000:06:00.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:06:00.0:pcie20]
Allocate Port Service[0000:06:00.0:pcie21]
PCI: Setting latency timer of device 0000:06:01.0 to 64
assign_interrupt_mode Found MSI capability
Allocate Port Service[0000:06:01.0:pcie20]
Allocate Port Service[0000:06:01.0:pcie21]
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:02.0:pcie01 failed with error 2
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:03.0:pcie01 failed with error 2
Evaluate _OSC Set fails. Status = 0x0005

IRQ handling difference between i386 and x86_64

Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:04.0:pcie01 failed with error 2
aer_init: AER service init fails – No ACPI _OSC support
aer: probe of 0000:00:05.0:pcie01 failed with error 1
Evaluate _OSC Set fails. Status = 0x0005
Evaluate _OSC Set fails. Status = 0x0005
aer_init: AER service init fails – Run ACPI _OSC fails
aer: probe of 0000:00:06.0:pcie01 failed with error 2
aer_init: AER service init fails – No ACPI _OSC support
aer: probe of 0000:00:07.0:pcie01 failed with error 1
input: Power Button (FF) as /class/input/input0
ACPI: Power Button (FF) [PWRF]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
ACPI Exception (processor_core-0783): AE_NOT_FOUND, Processor Device is not present [20070126]
Real Time Clock Driver v1.12ac
hpet_resources: 0xfed00000 is busy
intel_rng: FWH not detected
Linux agpgart interface v0.102 (c) Dave Jones
ipmi message handler version 39.1
ipmi device interface
IPMI System Interface driver.
ipmi_si: Trying SMBIOS-specified kcs state machine at i/o address 0xca8, slave address 0x20, irq 0
ipmi: Found new BMC (man_id: 0x0002a2, prod_id: 0x0100, dev_id: 0x20)
IPMI kcs interface initialized
IPMI Watchdog: driver initialized
Copyright (C) 2004 MontaVista Software – IPMI Powerdown via sys_reboot.
IPMI poweroff: ATCA Detect mfg 0x2A2 prod 0x100
IPMI poweroff: Found a chassis style poweroff function
Hangcheck: starting hangcheck timer 0.9.0 (tick is 180 seconds, margin is 60 seconds).
Hangcheck: Using get_cycles().
Serial: 8250/16550 driver \$Revision: 1.90 \$ 4 ports, IRQ sharing disabled
serial8250: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
serial8250: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
00:06: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
00:07: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
floppy0: no floppy controllers found
loop: loaded (max 8 devices)
Ethernet Channel Bonding Driver: v3.1.2 (January 20, 2007)
bonding: Warning: either miimon or arp_interval and arp_ip_target module parameters must be specified, otherwise bonding will not detect link failures! see bonding.txt for details.
Broadcom NetXtreme II Gigabit Ethernet Driver bnx2 v1.5.8.1 (May 7, 2007)
ACPI: PCI Interrupt 0000:04:00.0[A] -> GSI 16 (level, low) -> IRQ 16
eth0: Broadcom NetXtreme II BCM5708 1000Base-T (B2) PCI-X 64-bit 133MHz found at mem f8000000, IRQ 16, node addr 0019b9e2a6e9
ACPI: PCI Interrupt 0000:08:00.0[A] -> GSI 17 (level, low) -> IRQ 17
eth1: Broadcom NetXtreme II BCM5708 1000Base-T (B2) PCI-X 64-bit 133MHz found at mem f4000000, IRQ 17, node addr 0019b9e2a6eb
netconsole: not configured, aborting

IRQ handling difference between i386 and x86_64

st: Version 20070203, fixed bufsize 32768, s/g segs 256
ata_piix 0000:00:1f.1: version 2.10ac1
ACPI: PCI Interrupt 0000:00:1f.1[A] -> GSI 16 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:00:1f.1 to 64
ata1: PATA max UDMA/100 cmd 0x00000000000101f0 ctl 0x00000000000103f6 bmdma
0x000000000001fc00 irq 14
ata2: PATA max UDMA/100 cmd 0x0000000000010170 ctl 0x0000000000010376 bmdma
0x000000000001fc08 irq 15
scsi0 : ata_piix
ata1.00: ATAPI, max UDMA/33
ata1.00: configured for UDMA/33
scsi1 : ata_piix
ata2: port disabled. ignoring.
scsi 0:0:0:0: CD-ROM SONY DVD-ROM DDU810A KD38 PQ: 0 ANSI: 5
sr0: scsi3-mmc drive: 24x/24x cd/rw xa/form2 cdda tray
Uniform CD-ROM driver Revision: 3.20
sr 0:0:0:0: Attached scsi CD-ROM sr0
sr 0:0:0:0: Attached scsi generic sg0 type 5
ata_piix 0000:00:1f.2: MAP [P0 P2 P1 P3]
ACPI: PCI Interrupt 0000:00:1f.2[C] -> GSI 23 (level, low) -> IRQ 23
PCI: Setting latency timer of device 0000:00:1f.2 to 64
ata3: SATA max UDMA/133 cmd 0x000000000001cc98 ctl 0x000000000001cc92 bmdma
0x000000000001cc60 irq 23
ata4: SATA max UDMA/133 cmd 0x000000000001cc80 ctl 0x000000000001cc7a bmdma
0x000000000001cc68 irq 23
scsi2 : ata_piix
ATA: abnormal status 0x7F on port 0x000000000001cc9f
scsi3 : ata_piix
ATA: abnormal status 0x7F on port 0x000000000001cc87
Fusion MPT base driver 3.04.04
Copyright (c) 1999-2007 LSI Logic Corporation
Fusion MPT SPI Host driver 3.04.04
Fusion MPT FC Host driver 3.04.04
Fusion MPT SAS Host driver 3.04.04
ACPI: PCI Interrupt 0000:02:08.0[A] -> GSI 64 (level, low) -> IRQ 64
mptbase: Initiating ioc0 bringup
ioc0: SAS1068: Capabilities={Initiator}
scsi4 : ioc0: LSISAS1068, FwRev=000a3100h, Ports=1, MaxQ=366, IRQ=64
scsi 4:0:0:0: Direct-Access ATA ST3500630NS E PQ: 0 ANSI: 5
SCSI device sda: 976773168 512-byte hdwr sectors (500108 MB)
sda: Write Protect is off
sda: Mode Sense: 73 00 00 08
SCSI device sda: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
SCSI device sda: 976773168 512-byte hdwr sectors (500108 MB)
sda: Write Protect is off
sda: Mode Sense: 73 00 00 08
SCSI device sda: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
sda: sda1 sda2 sda3 sda4
sd 4:0:0:0: Attached scsi disk sda
sd 4:0:0:0: Attached scsi generic sg1 type 0
scsi 4:0:1:0: Direct-Access ATA ST3500630NS E PQ: 0 ANSI: 5

IRQ handling difference between i386 and x86_64

SCSI device sdb: 976773168 512-byte hdwr sectors (500108 MB)
sdb: Write Protect is off
sdb: Mode Sense: 73 00 00 08
SCSI device sdb: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
SCSI device sdb: 976773168 512-byte hdwr sectors (500108 MB)
sdb: Write Protect is off
sdb: Mode Sense: 73 00 00 08
SCSI device sdb: write cache: enabled, read cache: enabled, doesn't support DPO or FUA
sdb: sdb1 sdb2 sdb3 sdb4
sd 4:0:1:0: Attached scsi disk sdb
sd 4:0:1:0: Attached scsi generic sg2 type 0
Fusion MPT misc device (ioctl) driver 3.04.04
mptctl: Registered with Fusion MPT base driver
mptctl: /dev/mptctl @ (major,minor=10,220)
ACPI: PCI Interrupt 0000:00:1d.7[A] -> GSI 21 (level, low) -> IRQ 21
PCI: Setting latency timer of device 0000:00:1d.7 to 64
ehci_hcd 0000:00:1d.7: EHCI Host Controller
ehci_hcd 0000:00:1d.7: new USB bus registered, assigned bus number 1
ehci_hcd 0000:00:1d.7: debug port 1
PCI: cache line size of 32 is not supported by device 0000:00:1d.7
ehci_hcd 0000:00:1d.7: irq 21, io mem 0xfc600400
ehci_hcd 0000:00:1d.7: USB 2.0 started, EHCI 1.00, driver 10 Dec 2004
usb usb1: configuration #1 chosen from 1 choice
hub 1-0:1.0: USB hub found
hub 1-0:1.0: 6 ports detected
USB Universal Host Controller Interface driver v3.0
ACPI: PCI Interrupt 0000:00:1d.0[A] -> GSI 21 (level, low) -> IRQ 21
PCI: Setting latency timer of device 0000:00:1d.0 to 64
uhci_hcd 0000:00:1d.0: UHCI Host Controller
uhci_hcd 0000:00:1d.0: new USB bus registered, assigned bus number 2
uhci_hcd 0000:00:1d.0: irq 21, io base 0x0000cce0
usb usb2: configuration #1 chosen from 1 choice
hub 2-0:1.0: USB hub found
hub 2-0:1.0: 2 ports detected
ACPI: PCI Interrupt 0000:00:1d.1[B] -> GSI 20 (level, low) -> IRQ 20
PCI: Setting latency timer of device 0000:00:1d.1 to 64
uhci_hcd 0000:00:1d.1: UHCI Host Controller
uhci_hcd 0000:00:1d.1: new USB bus registered, assigned bus number 3
uhci_hcd 0000:00:1d.1: irq 20, io base 0x0000ccc0
usb usb3: configuration #1 chosen from 1 choice
hub 3-0:1.0: USB hub found
hub 3-0:1.0: 2 ports detected
ACPI: PCI Interrupt 0000:00:1d.2[C] -> GSI 21 (level, low) -> IRQ 21
PCI: Setting latency timer of device 0000:00:1d.2 to 64
uhci_hcd 0000:00:1d.2: UHCI Host Controller
uhci_hcd 0000:00:1d.2: new USB bus registered, assigned bus number 4
uhci_hcd 0000:00:1d.2: irq 21, io base 0x0000cca0
usb usb4: configuration #1 chosen from 1 choice
hub 4-0:1.0: USB hub found
hub 4-0:1.0: 2 ports detected
usb 1-5: new high speed USB device using ehci_hcd and address 3

IRQ handling difference between i386 and x86_64

```
usb 1-5: configuration #1 chosen from 1 choice
hub 1-5:1.0: USB hub found
hub 1-5:1.0: 4 ports detected
usb 3-1: new low speed USB device using uhci_hcd and address 2
usb 3-1: configuration #1 chosen from 1 choice
input: USB Keyboard as /class/input/input1
input: USB HID v1.10 Keyboard [ USB Keyboard] on usb-0000:00:1d.1-1
input: USB Keyboard as /class/input/input2
input: USB HID v1.10 Device [ USB Keyboard] on usb-0000:00:1d.1-1
usbcore: registered new interface driver usbhid
drivers/usb/input/hid-core.c: v2.6:USB HID core driver
PNP: No PS/2 controller found. Probing ports directly.
serio: i8042 KBD port at 0x60,0x64 irq 1
serio: i8042 AUX port at 0x60,0x64 irq 12
mice: PS/2 mouse device common for all mice
md: raid1 personality registered for level 1
raid6: int64x1 1746 MB/s
raid6: int64x2 2152 MB/s
raid6: int64x4 2148 MB/s
raid6: int64x8 1472 MB/s
raid6: sse2x1 2644 MB/s
raid6: sse2x2 4957 MB/s
raid6: sse2x4 6085 MB/s
raid6: using algorithm sse2x4 (6085 MB/s)
md: raid6 personality registered for level 6
md: raid5 personality registered for level 5
md: raid4 personality registered for level 4
raid5: automatically using best checksumming function: generic_sse
generic_sse: 6792.000 MB/sec
raid5: using function: generic_sse (6792.000 MB/sec)
device-mapper: ioctl: 4.11.0-ioctl (2006-10-12) initialised: dm-devel@xxxxxxxxxxx
device-mapper: multipath: version 1.0.5 loaded
device-mapper: multipath round-robin: version 1.0.0 loaded
EDAC MC: Ver: 2.0.1 Jun 29 2007
dcdbas dcdbas: Dell Systems Management Base Driver (version 5.6.0-3.2)
ACPI: PCI Interrupt 0000:00:08.0[A] -> GSI 16 (level, low) -> IRQ 16
PCI: Setting latency timer of device 0000:00:08.0 to 64
Intel(R) I/OAT DMA Engine found, 4 channels
Netfilter messages via NETLINK v0.30.
ip_tables: (C) 2000-2006 Netfilter Core Team
arp_tables: (C) 2002 David S. Miller
TCP cubic registered
NET: Registered protocol family 1
NET: Registered protocol family 10
ip6_tables: (C) 2000-2006 Netfilter Core Team
IPv6 over IPv4 tunneling driver
NET: Registered protocol family 17
BIOS EDD facility v0.16 2004-Jun-25, 2 devices found
md: Autodetecting RAID arrays.
md: autorun ...
md: considering sdb4 ...
```

IRQ handling difference between i386 and x86_64

```
md: adding sdb4 ...
md: sdb3 has different UUID to sdb4
md: sdb2 has different UUID to sdb4
md: adding sda4 ...
md: sda3 has different UUID to sdb4
md: sda2 has different UUID to sdb4
md: created md1
md: bind<sda4>
md: bind<sdb4>
md: running: <sdb4><sda4>
raid1: raid set md1 active with 2 out of 2 mirrors
md: considering sdb3 ...
md: adding sdb3 ...
md: sdb2 has different UUID to sdb3
md: adda0: 18 00 00 00 24 02 00 00 00 00 00 00 00 00 00 00
b0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
c0: 00 00 00 00 05 00 00 00 00 00 00 00 00 00 00 00
d0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
f0: 00 00 00 00 00 00 00 00 80 0f 01 00 00 00 00 00
```

01:00.0 PCI bridge: Intel Corporation 6702PXH PCI Express-to-PCI Bridge A (rev 09) (prog-if 00 [Normal decode])

Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr+ Stepping- SERR+ FastB2B-

Status: Cap+ 66MHz- UDF- FastB2B- ParErr- DEVSEL=fast >TAbort- <TAbort- <MAbort- >SERR- <PERR-

Latency: 0, Cache Line Size: 64 bytes

Bus: primary=01, secondary=02, subordinate=02, sec-latency=64

I/O behind bridge: 0000e000-0000efff

Memory behind bridge: fc400000-fc5fffff

Secondary status: 66MHz+ FastB2B+ ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- <SERR- <PERR-

BridgeCtl: Parity- SERR+ NoISA+ VGA- MAbort- >Reset- FastB2B-

Capabilities: [44] Express PCI/PCI-X Bridge IRQ 0

Device: Supported: MaxPayload 256 bytes, PhantFunc 0, ExtTag-

Device: Latency L0s <64ns, L1 <1us

Device: AtnBtn- AtnInd- PwrInd-

Device: Errors: Correctable- Non-Fatal- Fatal+ Unsupported-

Device: RlxdOrd- ExtTag- PhantFunc- AuxPwr- NoSnoop-

Device: MaxPayload 256 bytes, MaxReadReq 512 bytes

Link: Supported Speed 2.5Gb/s, Width x8, ASPM L0s, Port 0

Link: Latency L0s unlimited, L1 unlimited

Link: ASPM Disabled CommClk- ExtSynch-

Link: Speed 2.5Gb/s, Width x4

Capabilities: [5c] Message Signalled Interrupts: Mask- 64bit+ Queue=0/0 Enable-

Address: 0000000000000000 Data: 0000

Capabilities: [6c] Power Management version 2

Flags: PMEClk- DSI- D1- D2- AuxCurrent=0mA PME(D0+,D1-,D2-,D3hot+,D3cold+)

Status: D0 PME-Enable- DSel=0 DScale=0 PME-

Capabilities: [d8] PCI-X bridge device

IRQ handling difference between i386 and x86_64

Secondary Status: 64bit+ 133MHz+ SCD- USC- SCO- SRD- Freq=133MHz

Status: Dev=01:00.0 64bit- 133MHz- SCD- USC- SCO- SRD-

Upstream: Capacity=65535 CommitmentLimit=65535

Downstream: Capacity=65535 CommitmentLimit=65535

Capabilities: [100] Advanced Error Reporting

Capabilities: [300] Power Budgeting

00: 86 80 2c 03 47 01 10 00 09 00 04 06 10 00 81 00

10: 00 00 00 00 00 00 00 00 01 02 02 40 e0 e0 a0 02

20: 40 fc 50 fc f1 ff 01 00 00 00 00 00 00 00 00

30: 00 00 00 00 44 00 00 00 00 00 00 00 00 00 06 00

40: 08 6e 08 ff 10 5c 71 00 01 00 00 00 24 20 0a 00

50: 81 f4 03 00 00 00 41 00 00 00 00 00 05 6c 80 00

60: 00 00 00 00 00 00 00 00 00 00 00 00 01 d8 02 c8

70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

a0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

b0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

c0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

d0: 00 00 00 00 00 00 00 00 07 00 c3 00 00 01 00 00

e0: ff ff ff ff ff ff ff 01 00 00 00 00 00 00 00

f0: 00 00 00 00 00 00 00 00 00 00 00 00 01 00 00 00

02:08.0 SCSI storage controller: LSI Logic / Symbios Logic SAS1068 PCI-X Fusion-MPT SAS (rev 01)

Subsystem: Dell Unknown device 1f06

Control: I/O- Mem+ BusMaster+ SpecCycle- MemWINV+ VGASnoop- ParErr+ Stepping- SERR+ FastB2B-

Status: Cap+ 66MHz+ UDF- FastB2B- ParErr- DEVSEL=medium >TAbort- <TAbort- <MAbort- >SERR- <PERR-

Latency: 72 (16000ns min, 2500ns max), Cache Line Size: 64 bytes

Interrupt: pin A routed to IRQ 21

Region 0: I/O ports at ec00 [disabled] [size=256]

Region 1: Memory at fc4fc000 (64-bit, non-prefetchable) [size=16K]

Region 3: Memory at fc4e0000 (64-bit, non-prefetchable) [size=64K]

Expansion ROM at fc500000 [disabled] [size=1M]

Capabilities: [50] Power Management version 2

Flags: PMEClk- DSI- D1+ D2+ AuxCurrent=0mA PME(D0-,D1-,D2-,D3hot-,D3cold-)

Status: D0 PME-Enable