

# Slow Soft-RAID 5 performance

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*Source:* <http://linux.derkeiler.com/Mailing-Lists/Kernel/2007-07/msg07188.html>

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  - *Date:* Wed, 18 Jul 2007 10:56:11 +0100
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Hi,

I'm getting a strange slow performance behavior on a recently installed Server. Here are the details:

Server: Asus AS-TS500-E4A

Board: Asus DSBV-D (

<http://uk.asus.com/products.aspx?i1=9&i2=39&i3=299&i4=0&model=1210&modelmenu=2>

)

Hard Drives: 3x Seagate ST3400620AS (

<http://www.seagate.com/ww/v/index.jsp?vgnextoid=8eff99f4fa74c010VgnVCM100000dd04090aRCRD&locale=en-US>

)

I'm using the AHCI driver, although with ata\_piix, the behavior is the same. Here's some info about the AHCI controller:

00:1f.2 SATA controller: Intel Corporation 631xESB/632xESB SATA Storage Controller AHCI (rev 09) (prog-if 01 [AHCI 1.0])

Subsystem: ASUSTeK Computer Inc. Unknown device 81dc

Flags: bus master, 66MHz, medium devsel, latency 0, IRQ 19

I/O ports at 18c0 [size=8]

I/O ports at 1894 [size=4]

I/O ports at 1898 [size=8]

I/O ports at 1890 [size=4]

I/O ports at 18a0 [size=32]

Memory at c8000400 (32-bit, non-prefetchable) [size=1K]

Capabilities: [70] Power Management version 2

Capabilities: [a8] #12 [0010]

The Kernel boot log is attached as boot.msg

I can get a write throughput of 60 MB/sec on each HD by issuing the command 'time `dd if=/dev/zero of=test.raw bs=4k count=\$(( 1024 \* 1024 / 4 )); sync`'

Until this point everything seems acceptable, IMHO. The problem starts when I test the software-raid on all three HD's.

Configuration: output of 'sfdisk -l'

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Disk /dev/sda: 48641 cylinders, 255 heads, 63 sectors/track  
Units = cylinders of 8225280 bytes, blocks of 1024 bytes, counting from 0

```
Device Boot Start End #cyls #blocks Id System
/dev/sda1 * 0+ 16 17- 136521 fd Linux raid autodetect
/dev/sda2 17 82 66 530145 fd Linux raid autodetect
/dev/sda3 83 48640 48558 390042135 fd Linux raid autodetect
/dev/sda4 0 - 0 0 0 Empty
```

Disk /dev/sdb: 48641 cylinders, 255 heads, 63 sectors/track  
Units = cylinders of 8225280 bytes, blocks of 1024 bytes, counting from 0

```
Device Boot Start End #cyls #blocks Id System
/dev/sdb1 * 0+ 16 17- 136521 fd Linux raid autodetect
/dev/sdb2 17 82 66 530145 fd Linux raid autodetect
/dev/sdb3 83 48640 48558 390042135 fd Linux raid autodetect
/dev/sdb4 0 - 0 0 0 Empty
```

Disk /dev/sdc: 48641 cylinders, 255 heads, 63 sectors/track  
Units = cylinders of 8225280 bytes, blocks of 1024 bytes, counting from 0

```
Device Boot Start End #cyls #blocks Id System
/dev/sdc1 * 0+ 16 17- 136521 fd Linux raid autodetect
/dev/sdc2 17 82 66 530145 fd Linux raid autodetect
/dev/sdc3 83 48640 48558 390042135 fd Linux raid autodetect
/dev/sdc4 0 - 0 0 0 Empty
```

Configuration: output of 'cat /proc/mdstat'

```
Personalities : [raid6] [raid5] [raid4] [raid0] [raid1] [linear]
md0 : active raid1 sda1[0] sdc1[2] sdb1[1]
136448 blocks [3/3] [UUU]
```

```
md1 : active raid5 sda2[0] sdc2[2] sdb2[1]
1060096 blocks level 5, 128k chunk, algorithm 2 [3/3] [UUU]
```

```
md2 : active raid5 sdc3[2] sda3[0] sdb3[1]
780083968 blocks level 5, 128k chunk, algorithm 2 [3/3] [UUU]
```

unused devices: <none>

The RAID device I'm testing on is /dev/md2. Now, by issuing the same command 'dd if=/dev/zero of=test.raw bs=4k count=\$(( 1024 \* 1024 / 4 )); sync`' on the raid device mount point, I get the following speeds:  
With stripe\_cache\_size at default '265': 51 MB/sec  
With stripe\_cache\_size at '8192': 73 MB/sec

Extra notes:

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- All HD have queue\_depth at '31', with means NCQ is ON. If I disable NCQ by setting the value to '1' the write speed achieved is lower.
- Although I started from a fresh openSUSE 10.2 installation, I'm now running a vanilla 2.6.22.1 kernel
- Kernel is running with Generic-x86-64
- Soft-RAID bitmap is disabled. If Enable it, the performance takes a serious hit.
- The processor is the Intel Xeon Dual Core 5060 Family 15 with Hyperthreading activated. If it is deactivated, the performance on this specific subject is the same.
- Filesystem is ext3

Final quote: Shouldn't I, at least, be able to get write speeds of 120MB/sec instead of the current 73MB/sec? Is this a Soft-RAID problem or could it be something else ? Or I'm just missing something ?

Thanks for your time,  
Rui Santos

```
Inspecting /boot/System.map-2.6.22.1-default
Loaded 26530 symbols from /boot/System.map-2.6.22.1-default.
Symbols match kernel version 2.6.22.
No module symbols loaded - kernel modules not enabled.
```

```
klogd 1.4.1, log source = ksyslog started.
<5>Linux version 2.6.22.1-default (root@NewServer-RD) (gcc version 4.1.2 20061115 (prerelease) (SUSE
Linux)) #1 SMP Tue Jul 17 14:38:37 WEST 2007
<6>Command line: root=/dev/md2 vga=normal noresume splash=off showopts
<6>BIOS-provided physical RAM map:
<4> BIOS-e820: 0000000000000000 - 000000000009cc00 (usable)
<4> BIOS-e820: 000000000009cc00 - 00000000000a0000 (reserved)
<4> BIOS-e820: 00000000000cc000 - 00000000000d0000 (reserved)
<4> BIOS-e820: 00000000000e0000 - 0000000000100000 (reserved)
<4> BIOS-e820: 0000000000100000 - 000000007ff00000 (usable)
<4> BIOS-e820: 000000007ff00000 - 000000007ff0a000 (ACPI data)
<4> BIOS-e820: 000000007ff0a000 - 000000007ff80000 (ACPI NVS)
<4> BIOS-e820: 000000007ff80000 - 0000000080000000 (reserved)
<4> BIOS-e820: 00000000e0000000 - 00000000f0000000 (reserved)
<4> BIOS-e820: 00000000fec00000 - 00000000fec10000 (reserved)
<4> BIOS-e820: 00000000fee00000 - 00000000fee01000 (reserved)
<4> BIOS-e820: 00000000ff000000 - 0000000100000000 (reserved)
<7>Entering add_active_range(0, 0, 156) 0 entries of 3200 used
<7>Entering add_active_range(0, 256, 524032) 1 entries of 3200 used
<4>end_pfn_map = 1048576
<6>DMI present.
<4>ACPI: RSDP 000F6220, 0014 (r0 PTLTD )
<4>ACPI: RSDT 7FF03158, 0040 (r1 PTLTD RSDT 6040000 LTP 0)
<4>ACPI: FACP 7FF09D49, 00F4 (r3 ASUS DSBF-D 6040000 PTL 3)
<4>ACPI: DSDT 7FF04584, 57C5 (r1 Intel BLAKFORD 6040000 MSFT 100000E)
<4>ACPI: FACS 7FF0AFC0, 0040
```

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```
<4>ACPI: APIC 7FF09E3D, 0090 (r1 PTLTD APIC 6040000 LTP 0)
<4>ACPI: MCFG 7FF09ECD, 003C (r1 PTLTD MCFG 6040000 LTP 0)
<4>ACPI: BOOT 7FF09F09, 0028 (r1 PTLTD $SBFTBL$ 6040000 LTP 1)
<4>ACPI: SPCR 7FF09F31, 0050 (r1 PTLTD $UCRTBL$ 6040000 PTL 1)
<4>ACPI: ASF! 7FF09F81, 007F (r32 OEMID OEMTBL 6040000 PTL 1)
<4>ACPI: SSDT 7FF03198, 13EC (r1 PmRef CpuPm 3000 INTL 20050228)
<6>No NUMA configuration found
<6>Faking a node at 0000000000000000-000000007ff00000
<7>Entering add_active_range(0, 0, 156) 0 entries of 3200 used
<7>Entering add_active_range(0, 256, 524032) 1 entries of 3200 used
<6>Bootmem setup node 0 0000000000000000-000000007ff00000
<4>Zone PFN ranges:
<4> DMA 0 -> 4096
<4> DMA32 4096 -> 1048576
<4> Normal 1048576 -> 1048576
<4>early_node_map[2] active PFN ranges
<4> 0: 0 -> 156
<4> 0: 256 -> 524032
<7>On node 0 totalpages: 523932
<7> DMA zone: 56 pages used for memmap
<7> DMA zone: 1270 pages reserved
<7> DMA zone: 2670 pages, LIFO batch:0
<7> DMA32 zone: 7108 pages used for memmap
<7> DMA32 zone: 512828 pages, LIFO batch:31
<7> Normal zone: 0 pages used for memmap
<6>ACPI: PM-Timer IO Port: 0x1008
<7>ACPI: Local APIC address 0xfe00000
<6>ACPI: LAPIC (acpi_id[0x00] lapic_id[0x00] enabled)
<6>Processor #0 (Bootup-CPU)
<6>ACPI: LAPIC (acpi_id[0x01] lapic_id[0x02] enabled)
<6>Processor #2
<6>ACPI: LAPIC (acpi_id[0x02] lapic_id[0x01] enabled)
<6>Processor #1
<6>ACPI: LAPIC (acpi_id[0x03] lapic_id[0x03] enabled)
<6>Processor #3
<6>ACPI: LAPIC_NMI (acpi_id[0x00] high edge lint[0x1])
<6>ACPI: LAPIC_NMI (acpi_id[0x01] high edge lint[0x1])
<6>ACPI: LAPIC_NMI (acpi_id[0x02] high edge lint[0x1])
<6>ACPI: LAPIC_NMI (acpi_id[0x03] high edge lint[0x1])
<6>ACPI: IOAPIC (id[0x04] address[0xfec00000] gsi_base[0])
<6>IOAPIC[0]: apic_id 4, address 0xfec00000, GSI 0-23
<6>ACPI: IOAPIC (id[0x05] address[0xfec80000] gsi_base[24])
<6>IOAPIC[1]: apic_id 5, address 0xfec80000, GSI 24-47
<6>ACPI: INT_SRC_OVR (bus 0 bus_irq 0 global_irq 2 high edge)
<6>ACPI: INT_SRC_OVR (bus 0 bus_irq 9 global_irq 9 high level)
<7>ACPI: IRQ0 used by override.
<7>ACPI: IRQ2 used by override.
<7>ACPI: IRQ9 used by override.
<6>Setting APIC routing to flat
<6>Using ACPI (MADT) for SMP configuration information
<4>swsusp: Registered nosave memory region: 000000000009c000 - 000000000009d000
```

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```
<4>swsusp: Registered nosave memory region: 000000000009d000 – 00000000000a0000
<4>swsusp: Registered nosave memory region: 00000000000a0000 – 00000000000cc000
<4>swsusp: Registered nosave memory region: 00000000000cc000 – 00000000000d0000
<4>swsusp: Registered nosave memory region: 00000000000d0000 – 00000000000e0000
<4>swsusp: Registered nosave memory region: 00000000000e0000 – 0000000000100000
<6>Allocating PCI resources starting at 88000000 (gap: 80000000:60000000)
<6>SMP: Allowing 4 CPUs, 0 hotplug CPUs
<6>PERCPU: Allocating 50440 bytes of per cpu data
<4>Built 1 zonelists. Total pages: 515498
<5>Kernel command line: root=/dev/md2 vga=normal noresume splash=off showopts
<4>Initializing CPU#0
<4>PID hash table entries: 4096 (order: 12, 32768 bytes)
<6>Extended CMOS year: 2000
<6>time.c: Detected 3192.057 MHz processor.
<4>Console: colour VGA+ 80x25
<4>Checking aperture...
<7>Calgary: detecting Calgary via BIOS EBDA area
<7>Calgary: Unable to locate Rio Grande table in EBDA – bailing!
<4>Memory: 2058140k/2096128k available (2056k kernel code, 37588k reserved, 1023k data, 316k init)
<4>Calibrating delay using timer specific routine.. 6389.79 BogoMIPS (lpj=12779598)
<6>Security Framework v1.0.0 initialized
<4>Dentry cache hash table entries: 262144 (order: 9, 2097152 bytes)
<4>Inode-cache hash table entries: 131072 (order: 8, 1048576 bytes)
<4>Mount-cache hash table entries: 256
<6>CPU: Trace cache: 12K uops, L1 D cache: 16K
<6>CPU: L2 cache: 2048K
<6>CPU 0/0 -> Node 0
<4>using mwait in idle threads.
<6>CPU: Physical Processor ID: 0
<6>CPU: Processor Core ID: 0
<6>CPU0: Thermal monitoring enabled (TM1)
<6>SMP alternatives: switching to UP code
<6>ACPI: Core revision 20070126
<4>Parsing all Control Methods:
<4>Table [DSDT](id 0001) – 515 Objects with 60 Devices 154 Methods 27 Regions
<4>Parsing all Control Methods:
<4>Table [SSDT](id 0002) – 43 Objects with 0 Devices 16 Methods 0 Regions
<4> tbxface-0587 [02] tb_load_namespace : ACPI Tables successfully acquired
<4>evxfevnt-0091 [02] enable : Transition to ACPI mode successful
<6>Using local APIC timer interrupts.
<4>result 16625227
<6>Detected 16.625 MHz APIC timer.
<6>SMP alternatives: switching to SMP code
<6>Booting processor 1/4 APIC 0x2
<4>Initializing CPU#1
<4>Calibrating delay using timer specific routine.. 6384.46 BogoMIPS (lpj=12768924)
<6>CPU: Trace cache: 12K uops, L1 D cache: 16K
<6>CPU: L2 cache: 2048K
<6>CPU 1/2 -> Node 0
<6>CPU: Physical Processor ID: 0
<6>CPU: Processor Core ID: 1
```

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```
<6>CPU1: Thermal monitoring enabled (TM1)
<4> Intel(R) Xeon(TM) CPU 3.20GHz stepping 04
<6>checking TSC synchronization [CPU#0 -> CPU#1]:
<4>Measured 744 cycles TSC warp between CPUs, turning off TSC clock.
<4>Marking TSC unstable due to check_tsc_sync_source failed
<6>SMP alternatives: switching to SMP code
<6>Booting processor 2/4 APIC 0x1
<4>Initializing CPU#2
<4>Calibrating delay using timer specific routine.. 6384.37 BogoMIPS (lpj=12768754)
<6>CPU: Trace cache: 12K uops, L1 D cache: 16K
<6>CPU: L2 cache: 2048K
<6>CPU 2/1 -> Node 0
<6>CPU: Physical Processor ID: 0
<6>CPU: Processor Core ID: 0
<6>CPU2: Thermal monitoring enabled (TM1)
<4> Intel(R) Xeon(TM) CPU 3.20GHz stepping 04
<6>SMP alternatives: switching to SMP code
<6>Booting processor 3/4 APIC 0x3
<4>Initializing CPU#3
<4>Calibrating delay using timer specific routine.. 6384.49 BogoMIPS (lpj=12768990)
<6>CPU: Trace cache: 12K uops, L1 D cache: 16K
<6>CPU: L2 cache: 2048K
<6>CPU 3/3 -> Node 0
<6>CPU: Physical Processor ID: 0
<6>CPU: Processor Core ID: 1
<6>CPU3: Thermal monitoring enabled (TM1)
<4> Intel(R) Xeon(TM) CPU 3.20GHz stepping 04
<6>Brought up 4 CPUs
<4>migration_cost=4,1483
<6>NET: Registered protocol family 16
<6>ACPI: bus type pci registered
<6>PCI: Using MMCONFIG at e0000000 - e07ffff
<5>PCI: No mmconfig possible on device 08:02
<4>evgpeblk-0952 [04] ev_create_gpe_block : GPE 00 to 1F [_GPE] 4 regs on int 0x9
<4>evgpeblk-1048 [03] ev_initialize_gpe_bloc: Found 12 Wake, Enabled 0 Runtime GPEs in this block
<4>Completing Region/Field/Buffer/Package initialization:.....
<4>Initialized 27/27 Regions 0/0 Fields 34/34 Buffers 6/30 Packages (567 nodes)
<4>Initializing Device/Processor/Thermal objects by executing _INI methods:.
<4>Executed 1 _INI methods requiring 0 _STA executions (examined 70 objects)
<6>ACPI: Interpreter enabled
<6>ACPI: (supports S0 S1 S4 S5)
<6>ACPI: Using IOAPIC for interrupt routing
<6>ACPI: PCI Root Bridge [PCI0] (0000:00)
<7>PCI: Probing PCI hardware (bus 00)
<6>PCI: Transparent bridge - 0000:00:1e.0
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.P0P2._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.P0P2.BMD0._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.P0P2.BMD0.BPD0._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.P0P2.BMD0.BPD2._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.P0P2.BMF3._PRT]
```

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```
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.P0P3._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PEX0._PRT]
<7>ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PCIB._PRT]
<4>ACPI: PCI Interrupt Link [LNKA] (IRQs 3 4 5 6 7 10 11 14 15) *9
<4>ACPI: PCI Interrupt Link [LNKB] (IRQs 3 4 *5 6 7 10 11 14 15)
<4>ACPI: PCI Interrupt Link [LNKC] (IRQs 3 4 5 6 7 10 *11 14 15)
<4>ACPI: PCI Interrupt Link [LNKD] (IRQs 3 4 5 6 7 *10 11 14 15)
<4>ACPI: PCI Interrupt Link [LNKE] (IRQs 3 4 5 6 7 10 11 14 15) *0, disabled.
<4>ACPI: PCI Interrupt Link [LNKF] (IRQs 4 5 6 7 10 11 14 15) *0, disabled.
<4>ACPI: PCI Interrupt Link [LNKG] (IRQs 3 4 5 6 7 10 11 14 15) *0, disabled.
<4>ACPI: PCI Interrupt Link [LNKH] (IRQs 4 5 6 7 10 11 14 15) *0, disabled.
<6>Linux Plug and Play Support v0.97 (c) Adam Belay
<6>pnp: PnP ACPI init
<6>ACPI: bus type pnp registered
<6>pnp: PnP ACPI: found 12 devices
<6>ACPI: ACPI bus type pnp unregistered
<6>PCI: Using ACPI for IRQ routing
<6>PCI: If a device doesn't work, try "pci=routeirq". If it helps, post a report
<6>PCI-GART: No AMD northbridge found.
<4>ACPI: RTC can wake from S4
<6>pnp: 00:01: iomem range 0xe0000000-0xffffffff could not be reserved
<6>pnp: 00:01: iomem range 0xfed20000-0xfed3ffff has been reserved
<6>pnp: 00:01: iomem range 0xfed45000-0xfed7ffff has been reserved
<6>pnp: 00:01: iomem range 0xfef00000-0xfef0ffff could not be reserved
<6>PCI: Bridge: 0000:02:00.0
<6> IO window: disabled.
<6>Time: acpi_pm clocksource has been installed.
<6> MEM window: disabled.
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:02:02.0
<6> IO window: 2000-2fff
<6> MEM window: c8200000-c82fffff
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:01:00.0
<6> IO window: 2000-2fff
<6> MEM window: c8200000-c82fffff
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:01:00.3
<6> IO window: disabled.
<6> MEM window: disabled.
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:00:02.0
<6> IO window: 2000-2fff
<6> MEM window: c8100000-c82fffff
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:00:03.0
<6> IO window: disabled.
<6> MEM window: disabled.
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:00:1c.0
<6> IO window: disabled.
```

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```
<6> MEM window: disabled.
<6> PREFETCH window: disabled.
<6>PCI: Bridge: 0000:00:1e.0
<6> IO window: 3000-3fff
<6> MEM window: c8300000-c83fffff
<6> PREFETCH window: d0000000-d7ffffff
<7>PCI: Setting latency timer of device 0000:00:02.0 to 64
<6>ACPI: PCI Interrupt 0000:01:00.0[A] -> GSI 16 (level, low) -> IRQ 16
<7>PCI: Setting latency timer of device 0000:01:00.0 to 64
<6>ACPI: PCI Interrupt 0000:02:00.0[A] -> GSI 16 (level, low) -> IRQ 16
<7>PCI: Setting latency timer of device 0000:02:00.0 to 64
<6>ACPI: PCI Interrupt 0000:02:02.0[A] -> GSI 18 (level, low) -> IRQ 18
<7>PCI: Setting latency timer of device 0000:02:02.0 to 64
<7>PCI: Setting latency timer of device 0000:01:00.3 to 64
<7>PCI: Setting latency timer of device 0000:00:03.0 to 64
<6>ACPI: PCI Interrupt 0000:00:1c.0[A] -> GSI 17 (level, low) -> IRQ 17
<7>PCI: Setting latency timer of device 0000:00:1c.0 to 64
<7>PCI: Setting latency timer of device 0000:00:1e.0 to 64
<6>NET: Registered protocol family 2
<4>IP route cache hash table entries: 65536 (order: 7, 524288 bytes)
<4>TCP established hash table entries: 262144 (order: 10, 6291456 bytes)
<4>TCP bind hash table entries: 65536 (order: 8, 1048576 bytes)
<6>TCP: Hash tables configured (established 262144 bind 65536)
<6>TCP reno registered
<6>Unpacking initramfs... done
<6>Freeing initrd memory: 3463k freed
<6>Simple Boot Flag at 0x40 set to 0x1
<6>audit: initializing netlink socket (disabled)
<5>audit(1184690519.240:1): initialized
<4>Total HugeTLB memory allocated, 0
<5>VFS: Disk quotas dquot_6.5.1
<4>Dquot-cache hash table entries: 512 (order 0, 4096 bytes)
<6>io scheduler noop registered
<6>io scheduler anticipatory registered
<6>io scheduler deadline registered
<6>io scheduler cfq registered (default)
<4>0000:00:1d.7 EHCI: BIOS handoff failed (BIOS bug ?) 01010001
<7>Boot video device is 0000:08:02.0
<7>PCI: Setting latency timer of device 0000:00:02.0 to 64
<4>assign_interrupt_mode Found MSI capability
<7>Allocate Port Service[0000:00:02.0:pcie00]
<7>Allocate Port Service[0000:00:02.0:pcie01]
<7>PCI: Setting latency timer of device 0000:00:03.0 to 64
<4>assign_interrupt_mode Found MSI capability
<7>Allocate Port Service[0000:00:03.0:pcie00]
<7>Allocate Port Service[0000:00:03.0:pcie01]
<7>PCI: Setting latency timer of device 0000:00:1c.0 to 64
<4>assign_interrupt_mode Found MSI capability
<7>Allocate Port Service[0000:00:1c.0:pcie00]
<7>Allocate Port Service[0000:00:1c.0:pcie02]
<7>Allocate Port Service[0000:00:1c.0:pcie03]
```

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```
<7>PCI: Setting latency timer of device 0000:01:00.0 to 64
<7>Allocate Port Service[0000:01:00.0:pcie10]
<7>Allocate Port Service[0000:01:00.0:pcie11]
<7>PCI: Setting latency timer of device 0000:02:00.0 to 64
<4>assign_interrupt_mode Found MSI capability
<7>Allocate Port Service[0000:02:00.0:pcie20]
<7>Allocate Port Service[0000:02:00.0:pcie21]
<7>PCI: Setting latency timer of device 0000:02:02.0 to 64
<4>assign_interrupt_mode Found MSI capability
<7>Allocate Port Service[0000:02:02.0:pcie20]
<7>Allocate Port Service[0000:02:02.0:pcie21]
<7>Evaluate _OSC Set fails. Status = 0x0005
<7>Evaluate _OSC Set fails. Status = 0x0005
<7>aer_init: AER service init fails - Run ACPI _OSC fails
<4>aer: probe of 0000:00:02.0:pcie01 failed with error 2
<7>Evaluate _OSC Set fails. Status = 0x0005
<7>Evaluate _OSC Set fails. Status = 0x0005
<7>aer_init: AER service init fails - Run ACPI _OSC fails
<4>aer: probe of 0000:00:03.0:pcie01 failed with error 2
<6>Real Time Clock Driver v1.12ac
<6>Non-volatile memory driver v1.2
<6>Linux agpgart interface v0.102 (c) Dave Jones
<6>Serial: 8250/16550 driver $Revision: 1.90 $ 4 ports, IRQ sharing disabled
<6>00:08: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
<6>00:09: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
<6>PNP: PS/2 Controller [PNP0303:KBC0,PNP0f13:PSM0] at 0x60,0x64 irq 1,12
<6>serio: i8042 KBD port at 0x60,0x64 irq 1
<6>serio: i8042 AUX port at 0x60,0x64 irq 12
<6>mice: PS/2 mouse device common for all mice
<6>input: AT Translated Set 2 keyboard as /class/input/input0
<6>input: PC Speaker as /class/input/input1
<6>NET: Registered protocol family 1
<6>Freeing unused kernel memory: 316k freed
<6>Uniform Multi-Platform E-IDE driver Revision: 7.00alpha2
<6>ide: Assuming 33MHz system bus speed for PIO modes; override with idebus=xx
<5>SCSI subsystem initialized
<6>ACPI: Processor [CPU0] (supports 8 throttling states)
<6>ACPI: Processor [CPU1] (supports 8 throttling states)
<6>ACPI: Processor [CPU2] (supports 8 throttling states)
<6>ACPI: Processor [CPU3] (supports 8 throttling states)
<4>ACPI Exception (processor_core-0781): AE_NOT_FOUND, Processor Device is not present [20070126]
<4>ACPI Exception (processor_core-0781): AE_NOT_FOUND, Processor Device is not present [20070126]
<4>ACPI Exception (processor_core-0781): AE_NOT_FOUND, Processor Device is not present [20070126]
<4>ACPI Exception (processor_core-0781): AE_NOT_FOUND, Processor Device is not present [20070126]
<6>ESB2: IDE controller at PCI slot 0000:00:1f.1
<6>ACPI: PCI Interrupt 0000:00:1f.1[A] -> GSI 18 (level, low) -> IRQ 18
<6>ESB2: chipset revision 9
<6>ESB2: not 100% native mode: will probe irqs later
<6> ide0: BM-DMA at 0x1880-0x1887, BIOS settings: hda:DMA, hdb:pio
<7>Probing IDE interface ide0...
<4>hda: ASUS DVD-E616A3, ATAPI CD/DVD-ROM drive
```

## Slow Soft-RAID 5 performance

```
<4>hda: drive side 80-wire cable detection failed, limiting max speed to UDMA33
<7>hda: selected mode 0x42
<4>ide0 at 0x1f0-0x1f7,0x3f6 on irq 14
<7>libata version 2.21 loaded.
<7>ahci 0000:00:1f.2: version 2.2
<6>ACPI: PCI Interrupt 0000:00:1f.2[B] -> GSI 19 (level, low) -> IRQ 19
<6>ahci 0000:00:1f.2: AHCI 0001.0100 32 slots 6 ports 3 Gbps 0x3f impl SATA mode
<6>ahci 0000:00:1f.2: flags: 64bit ncq pm led pmp slum part
<7>PCI: Setting latency timer of device 0000:00:1f.2 to 64
<6>scsi0 : ahci
<6>scsi1 : ahci
<6>scsi2 : ahci
<6>scsi3 : ahci
<6>scsi4 : ahci
<6>scsi5 : ahci
<6>ata1: SATA max UDMA/133 cmd 0xffffc2000032a500 ctl 0x0000000000000000 bmdma
0x0000000000000000 irq 19
<6>ata2: SATA max UDMA/133 cmd 0xffffc2000032a580 ctl 0x0000000000000000 bmdma
0x0000000000000000 irq 19
<6>ata3: SATA max UDMA/133 cmd 0xffffc2000032a600 ctl 0x0000000000000000 bmdma
0x0000000000000000 irq 19
<6>ata4: SATA max UDMA/133 cmd 0xffffc2000032a680 ctl 0x0000000000000000 bmdma
0x0000000000000000 irq 19
<6>ata5: SATA max UDMA/133 cmd 0xffffc2000032a700 ctl 0x0000000000000000 bmdma
0x0000000000000000 irq 19
<6>ata6: SATA max UDMA/133 cmd 0xffffc2000032a780 ctl 0x0000000000000000 bmdma
0x0000000000000000 irq 19
<6>ata1: SATA link up 3.0 Gbps (SStatus 123 SControl 300)
<6>ata1.00: ATA-7: ST3400620AS, 3.AAK, max UDMA/133
<6>ata1.00: 781422768 sectors, multi 0: LBA48 NCQ (depth 31/32)
<6>ata1.00: configured for UDMA/133
<6>ata2: SATA link up 3.0 Gbps (SStatus 123 SControl 300)
<6>ata2.00: ATA-7: ST3400620AS, 3.AAK, max UDMA/133
<6>ata2.00: 781422768 sectors, multi 0: LBA48 NCQ (depth 31/32)
<6>ata2.00: configured for UDMA/133
<6>ata3: SATA link up 3.0 Gbps (SStatus 123 SControl 300)
<6>ata3.00: ATA-7: ST3400620AS, 3.AAK, max UDMA/133
<6>ata3.00: 781422768 sectors, multi 0: LBA48 NCQ (depth 31/32)
<6>ata3.00: configured for UDMA/133
<6>ata4: SATA link down (SStatus 0 SControl 300)
<6>ata5: SATA link down (SStatus 0 SControl 300)
<6>ata6: SATA link down (SStatus 0 SControl 300)
<5>scsi 0:0:0:0: Direct-Access ATA ST3400620AS 3.AA PQ: 0 ANSI: 5
<5>sd 0:0:0:0: [sda] 781422768 512-byte hardware sectors (400088 MB)
<5>sd 0:0:0:0: [sda] Write Protect is off
<7>sd 0:0:0:0: [sda] Mode Sense: 00 3a 00 00
<5>sd 0:0:0:0: [sda] Write cache: enabled, read cache: enabled, doesn't support DPO or FUA
<5>sd 0:0:0:0: [sda] 781422768 512-byte hardware sectors (400088 MB)
<5>sd 0:0:0:0: [sda] Write Protect is off
<7>sd 0:0:0:0: [sda] Mode Sense: 00 3a 00 00
<5>sd 0:0:0:0: [sda] Write cache: enabled, read cache: enabled, doesn't support DPO or FUA
```

## Slow Soft-RAID 5 performance

```
<6> sda: sda1 sda2 sda3
<5>sd 0:0:0:0: [sda] Attached SCSI disk
<5>scsi 1:0:0:0: Direct-Access ATA ST3400620AS 3.AA PQ: 0 ANSI: 5
<5>sd 1:0:0:0: [sdb] 781422768 512-byte hardware sectors (400088 MB)
<5>sd 1:0:0:0: [sdb] Write Protect is off
<7>sd 1:0:0:0: [sdb] Mode Sense: 00 3a 00 00
<5>sd 1:0:0:0: [sdb] Write cache: enabled, read cache: enabled, doesn't support DPO or FUA
<5>sd 1:0:0:0: [sdb] 781422768 512-byte hardware sectors (400088 MB)
<5>sd 1:0:0:0: [sdb] Write Protect is off
<7>sd 1:0:0:0: [sdb] Mode Sense: 00 3a 00 00
<5>sd 1:0:0:0: [sdb] Write cache: enabled, read cache: enabled, doesn't support DPO or FUA
<6> sdb: sdb1 sdb2 sdb3
<5>sd 1:0:0:0: [sdb] Attached SCSI disk
<5>scsi 2:0:0:0: Direct-Access ATA ST3400620AS 3.AA PQ: 0 ANSI: 5
<5>sd 2:0:0:0: [sdc] 781422768 512-byte hardware sectors (400088 MB)
<5>sd 2:0:0:0: [sdc] Write Protect is off
<7>sd 2:0:0:0: [sdc] Mode Sense: 00 3a 00 00
<5>sd 2:0:0:0: [sdc] Write cache: enabled, read cache: enabled, doesn't support DPO or FUA
<5>sd 2:0:0:0: [sdc] 781422768 512-byte hardware sectors (400088 MB)
<5>sd 2:0:0:0: [sdc] Write Protect is off
<7>sd 2:0:0:0: [sdc] Mode Sense: 00 3a 00 00
<5>sd 2:0:0:0: [sdc] Write cache: enabled, read cache: enabled, doesn't support DPO or FUA
<6> sdc:<5>sd 0:0:0:0: Attached scsi generic sg0 type 0
<5>sd 1:0:0:0: Attached scsi generic sg1 type 0
<4> sdc1 sdc2 sdc3
<5>sd 2:0:0:0: [sdc] Attached SCSI disk
<5>sd 2:0:0:0: Attached scsi generic sg2 type 0
<6>raid5: automatically using best checksumming function: generic_sse
<4> generic_sse: 3675.000 MB/sec
<4>raid5: using function: generic_sse (3675.000 MB/sec)
<4>raid6: int64x1 1327 MB/s
<4>raid6: int64x2 1829 MB/s
<4>raid6: int64x4 2298 MB/s
<4>raid6: int64x8 1707 MB/s
<4>raid6: sse2x1 2369 MB/s
<4>raid6: sse2x2 1872 MB/s
<4>raid6: sse2x4 3061 MB/s
<4>raid6: using algorithm sse2x4 (3061 MB/s)
<6>md: raid6 personality registered for level 6
<6>md: raid5 personality registered for level 5
<6>md: raid4 personality registered for level 4
<6>BIOS EDD facility v0.16 2004-Jun-25, 3 devices found
<6>md: raid0 personality registered for level 0
<6>md: raid1 personality registered for level 1
<6>md: linear personality registered for level -1
<6>md: md2 stopped.
<6>md: bind<sdb3>
<6>md: bind<sdc3>
<6>md: bind<sda3>
<6>raid5: device sda3 operational as raid disk 0
<6>raid5: device sdc3 operational as raid disk 2
```

## Slow Soft-RAID 5 performance

```
<6>raid5: device sdb3 operational as raid disk 1
<6>raid5: allocated 3212kB for md2
<4>raid5: raid level 5 set md2 active with 3 out of 3 devices, algorithm 2
<4>RAID5 conf printout:
<4> ---- rd:3 wd:3
<4> disk 0, o:1, dev:sda3
<4> disk 1, o:1, dev:sdb3
<4> disk 2, o:1, dev:sd3
<6>kjournald starting. Commit interval 5 seconds
<6>EXT3 FS on md2, internal journal
<6>EXT3-fs: mounted filesystem with ordered data mode.
<6>parport_pc 00:0b: reported by Plug and Play ACPI
<6>parport0: PC-style at 0x378 (0x778), irq 7, dma 3 [PCSPP,TRISTATE,COMPAT,EPP,ECP,DMA]
<6>lp0: using parport0 (interrupt-driven).
<3>intel_rng: FWH not detected
<6>pci_hotplug: PCI Hot Plug PCI Core version: 0.5
<6>usbcore: registered new interface driver usbfs
<6>usbcore: registered new interface driver hub
<6>usbcore: registered new device driver usb
<6>shpchp: Standard Hot Plug PCI Controller Driver version: 0.4
<6>USB Universal Host Controller Interface driver v3.0
<6>ACPI: PCI Interrupt 0000:00:1d.0[A] -> GSI 17 (level, low) -> IRQ 17
<7>PCI: Setting latency timer of device 0000:00:1d.0 to 64
<6>uhci_hcd 0000:00:1d.0: UHCI Host Controller
<6>uhci_hcd 0000:00:1d.0: new USB bus registered, assigned bus number 1
<6>uhci_hcd 0000:00:1d.0: irq 17, io base 0x00001800
<6>usb usb1: configuration #1 chosen from 1 choice
<6>hub 1-0:1.0: USB hub found
<6>hub 1-0:1.0: 2 ports detected
<6>rtc_cmos 00:04: rtc core: registered rtc_cmos as rtc0
<4>rtc_cmos: probe of 00:04 failed with error -16
<6>ACPI: PCI Interrupt 0000:00:1d.7[A] -> GSI 17 (level, low) -> IRQ 17
<7>PCI: Setting latency timer of device 0000:00:1d.7 to 64
<6>ehci_hcd 0000:00:1d.7: EHCI Host Controller
<6>ehci_hcd 0000:00:1d.7: new USB bus registered, assigned bus number 2
<6>ehci_hcd 0000:00:1d.7: debug port 1
<7>PCI: cache line size of 128 is not supported by device 0000:00:1d.7
<6>ehci_hcd 0000:00:1d.7: irq 17, io mem 0xc8000000
<6>ehci_hcd 0000:00:1d.7: USB 2.0 started, EHCI 1.00, driver 10 Dec 2004
<6>usb usb2: configuration #1 chosen from 1 choice
<6>hub 2-0:1.0: USB hub found
<6>hub 2-0:1.0: 8 ports detected
<6>Intel(R) PRO/1000 Network Driver - version 7.3.20-k2-NAPI
<6>Copyright (c) 1999-2006 Intel Corporation.
<6>hda: ATAPI 48X DVD-ROM drive, 198kB Cache, UDMA(33)
<6>Uniform CD-ROM driver Revision: 3.20
<6>Floppy drive(s): fd0 is 1.44M
<6>ACPI: PCI Interrupt 0000:00:1d.1[B] -> GSI 19 (level, low) -> IRQ 19
<7>PCI: Setting latency timer of device 0000:00:1d.1 to 64
<6>uhci_hcd 0000:00:1d.1: UHCI Host Controller
<6>uhci_hcd 0000:00:1d.1: new USB bus registered, assigned bus number 3
```

## Slow Soft-RAID 5 performance

```
<6>uhci_hcd 0000:00:1d.1: irq 19, io base 0x00001820
<6>usb usb3: configuration #1 chosen from 1 choice
<6>hub 3-0:1.0: USB hub found
<6>hub 3-0:1.0: 2 ports detected
<6>FDC 0 is a post-1991 82077
<6>ACPI: PCI Interrupt 0000:00:1d.2[C] -> GSI 18 (level, low) -> IRQ 18
<7>PCI: Setting latency timer of device 0000:00:1d.2 to 64
<6>uhci_hcd 0000:00:1d.2: UHCI Host Controller
<6>uhci_hcd 0000:00:1d.2: new USB bus registered, assigned bus number 4
<6>uhci_hcd 0000:00:1d.2: irq 18, io base 0x00001840
<6>usb usb4: configuration #1 chosen from 1 choice
<6>hub 4-0:1.0: USB hub found
<6>hub 4-0:1.0: 2 ports detected
<6>ACPI: PCI Interrupt 0000:00:1d.3[D] -> GSI 16 (level, low) -> IRQ 16
<7>PCI: Setting latency timer of device 0000:00:1d.3 to 64
<6>uhci_hcd 0000:00:1d.3: UHCI Host Controller
<6>uhci_hcd 0000:00:1d.3: new USB bus registered, assigned bus number 5
<6>uhci_hcd 0000:00:1d.3: irq 16, io base 0x00001860
<6>usb usb5: configuration #1 chosen from 1 choice
<6>hub 5-0:1.0: USB hub found
<6>hub 5-0:1.0: 2 ports detected
<6>ACPI: PCI Interrupt 0000:04:00.0[A] -> GSI 18 (level, low) -> IRQ 18
<7>PCI: Setting latency timer of device 0000:04:00.0 to 64
<6>ACPI: PCI Interrupt 0000:00:1f.3[B] -> GSI 19 (level, low) -> IRQ 19
<6>e1000: 0000:04:00.0: e1000_probe: (PCI Express:2.5Gb/s:Width x4) 00:1a:92:4d:15:ea
<6>e1000: eth0: e1000_probe: Intel(R) PRO/1000 Network Connection
<6>ACPI: PCI Interrupt 0000:04:00.1[B] -> GSI 19 (level, low) -> IRQ 19
<7>PCI: Setting latency timer of device 0000:04:00.1 to 64
<6>e1000: 0000:04:00.1: e1000_probe: (PCI Express:2.5Gb/s:Width x4) 00:1a:92:4d:15:eb
<6>e1000: eth1: e1000_probe: Intel(R) PRO/1000 Network Connection
<6>usb 1-1: new low speed USB device using uhci_hcd and address 2
<6>usb 1-1: configuration #1 chosen from 1 choice
<6>usbcore: registered new interface driver hiddev
<6>input: Genius NetScroll + Traveler as /class/input/input2
<6>input: USB HID v1.10 Mouse [Genius NetScroll + Traveler] on usb-0000:00:1d.0-1
<6>usbcore: registered new interface driver usbhid
<6>drivers/hid/usbhid/hid-core.c: v2.6:USB HID core driver
<3>Unable to find swap-space signature
<6>device-mapper: ioctl: 4.11.0-ioctl (2006-10-12) initialised: dm-devel@xxxxxxxxxxx
<6>md: md0 stopped.
<6>md: bind<sdb1>
<6>md: bind<sdc1>
<6>md: bind<sda1>
<6>raid1: raid set md0 active with 3 out of 3 mirrors
<6>md: md1 stopped.
<6>md: bind<sdb2>
<6>md: bind<sdc2>
<6>md: bind<sda2>
<6>raid5: device sda2 operational as raid disk 0
<6>raid5: device sdc2 operational as raid disk 2
<6>raid5: device sdb2 operational as raid disk 1
```

## Slow Soft-RAID 5 performance

```
<6>raid5: allocated 3212kB for md1
<4>raid5: raid level 5 set md1 active with 3 out of 3 devices, algorithm 2
<4>RAID5 conf printout:
<4> --- rd:3 wd:3
<4> disk 0, o:1, dev:sda2
<4> disk 1, o:1, dev:sdb2
<4> disk 2, o:1, dev:sd2
<6>loop: module loaded
<6>kjournald starting. Commit interval 5 seconds
<6>EXT3 FS on md0, internal journal
<6>EXT3-fs: mounted filesystem with ordered data mode.
Kernel logging (ksyslog) stopped.
Kernel log daemon terminating.
```

Boot logging started on /dev/tty1(/dev/console) at Tue Jul 17 16:42:07 2007

```
Creating device nodes with udev
Loading ide-core
Loading ide-disk
Loading scsi_mod
Loading sd_mod
Loading processor
Loading thermal
Loading piix
Loading libata
Loading ahci
Loading fan
Loading xor
Loading raid456
Loading edd
Loading raid0
Loading raid1
Loading linear
Loading jbd
Loading mbcache
Loading ext3
mdadm: /dev/md2 has been started with 3 drives.
Waiting for device /dev/md2 to appear: ok
showconsole: Warning: the ioctl TIOCGDEV is not known by the kernel
fsck 1.39 (29-May-2006)
[/bin/fsck.ext3 (1) -- /] fsck.ext3 -a -C0 /dev/md2
Root (/dev/md2): clean, 155265/97517568 files, 3764659/195020992 blocks
fsck succeeded. Mounting root device read-write.
Mounting root /dev/md2
```

Boot logging started on /dev/tty1(/dev/console) at Tue Jul 17 16:42:27 2007