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Intel Edison

「Intel Edison Kit for Arduino」を買ってみました。
性能とか、いろいろといじくって遊んでみようと思います。



Hardware

/proc/cpuinfo

まずは、誰しものが最初に確認するであろう /proc/cpuinfo を見てみます。

```
root@EdisonArduino:~# cat /proc/cpuinfo
processor       : 0
vendor_id      : GenuineIntel
cpu family     : 6
model          : 74
model name     : Genuine Intel(R) CPU    4000  @  500MHz
stepping       : 8
microcode      : 0x810
cpu MHz        : 500.000
cache size     : 1024 KB
physical id    : 0
siblings       : 2
core id        : 0
cpu cores      : 2
apicid         : 0
initial apicid : 0
fdiv_bug       : no
f00f_bug       : no
coma_bug       : no
fpu            : yes
fpu_exception  : yes
cpuid level    : 11
wp             : yes
flags          : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe nx rdtscp lm
constant_tsc arch_perfmon pebs bts xtopology nonstop_tsc aperfmperf
nonstop_tsc_s3 pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 cx16
xtpr pdcm sse4_1 sse4_2 movbe popcnt tsc_deadline_timer aes rdrand lahf_lm
3dnowprefetch ida arat epb dtherm tpr_shadow vnmi flexpriority ept vpid
tsc_adjust smep erms
bogomips       : 998.40
clflush size   : 64
```

```
cache_alignment : 64
address sizes   : 36 bits physical, 48 bits virtual
power management:

processor       : 1
vendor_id       : GenuineIntel
cpu family      : 6
model           : 74
model name      : Genuine Intel(R) CPU    4000  @  500MHz
stepping        : 8
microcode       : 0x810
cpu MHz         : 500.000
cache size      : 1024 KB
physical id     : 0
siblings        : 2
core id         : 1
cpu cores       : 2
apicid          : 2
initial apicid  : 2
fdiv_bug        : no
f00f_bug        : no
coma_bug        : no
fpu             : yes
fpu_exception   : yes
cpuid level     : 11
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe nx rdtscp lm
constant_tsc arch_perfmon pebs bts xtopology nonstop_tsc aperfmperf
nonstop_tsc_s3 pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 cx16
xtpr pdcm sse4_1 sse4_2 movbe popcnt tsc_deadline_timer aes rdrand lahf_lm
3dnowprefetch ida arat epb dtherm tpr_shadow vnmi flexpriority ept vpid
tsc_adjust smep erms
bogomips        : 998.40
clflush size     : 64
cache_alignment : 64
address sizes    : 36 bits physical, 48 bits virtual
power management:

root@EdisonArduino:~#
```

“aes” サポートがあります□OpenSSL とか、速いかもかもしれません。

lspci

```
root@EdisonArduino:~# lspci
00:00.0 Host bridge: Intel Corporation Device 1170 (rev 01)
00:01.0 SD Host controller: Intel Corporation Device 1190 (rev 01)
```

```
00:01.2 SD Host controller: Intel Corporation Device 1190 (rev 01)
00:01.3 SD Host controller: Intel Corporation Device 1190 (rev 01)
00:02.0 Display controller: Intel Corporation Device 1182 (rev 01)
00:04.0 Serial controller: Intel Corporation Device 1191 (rev 01)
00:04.1 Serial controller: Intel Corporation Device 1191 (rev 01)
00:04.2 Serial controller: Intel Corporation Device 1191 (rev 01)
00:04.3 Serial controller: Intel Corporation Device 1191 (rev 01)
00:05.0 Serial controller: Intel Corporation Device 1192 (rev 01)
00:06.0 System peripheral: Intel Corporation Device 1193 (rev 01)
00:06.1 System peripheral: Intel Corporation Device 1193 (rev 01)
00:07.0 System peripheral: Intel Corporation Device 1194 (rev 01)
00:07.1 System peripheral: Intel Corporation Device 1194 (rev 01)
00:07.2 System peripheral: Intel Corporation Device 1194 (rev 01)
00:08.0 Communication controller: Intel Corporation Device 1195 (rev 01)
00:08.1 Communication controller: Intel Corporation Device 1195 (rev 01)
00:08.2 Communication controller: Intel Corporation Device 1195 (rev 01)
00:08.3 Communication controller: Intel Corporation Device 1195 (rev 01)
00:09.0 Communication controller: Intel Corporation Device 1196 (rev 01)
00:09.1 Communication controller: Intel Corporation Device 1196 (rev 01)
00:09.2 Communication controller: Intel Corporation Device 1196 (rev 01)
00:0a.0 Communication controller: Intel Corporation Device 1197 (rev 01)
00:0b.0 Encryption controller: Intel Corporation Device 1198 (rev 01)
00:0c.0 System peripheral: Intel Corporation Device 1199 (rev 01)
00:0d.0 Multimedia audio controller: Intel Corporation Device 119a (rev 01)
00:0e.0 System peripheral: Intel Corporation Device 119b (rev 01)
00:11.0 USB controller: Intel Corporation Device 119e (rev 01)
00:12.0 Signal processing controller: Intel Corporation Device 119f (rev 01)
00:13.0 Co-processor: Intel Corporation Device 11a0 (rev 01)
00:14.0 Co-processor: Intel Corporation Device 11a1 (rev 01)
00:15.0 System peripheral: Intel Corporation Device 11a2 (rev 01)
00:16.0 Co-processor: Intel Corporation Device 11a3 (rev 01)
00:16.1 Co-processor: Intel Corporation Device 11a4 (rev 01)
00:17.0 System peripheral: Intel Corporation Device 11a5 (rev 01)
00:18.0 Display controller: Intel Corporation Device 11a6 (rev 01)
```

dmesg

```
[ 0.000000] Initializing cgroup subsys cpuset
[ 0.000000] Initializing cgroup subsys cpu
[ 0.000000] Initializing cgroup subsys cpuacct
[ 0.000000] Linux version 3.10.17-poky-edison+ (sys_dswci@ncsngdbuild04)
(gcc version 4.8.2 (GCC) ) #1 SMP PREEMPT Tue Oct 14 15:19:49 CEST 2014
[ 0.000000] e820: BIOS-provided physical RAM map:
[ 0.000000] BIOS-e820: [mem 0x0000000000000000-0x00000000000097fff] usable
[ 0.000000] BIOS-e820: [mem 0x0000000000100000-0x00000000003fffffff] usable
[ 0.000000] BIOS-e820: [mem 0x0000000000400000-0x00000000005fffffff]
reserved
[ 0.000000] BIOS-e820: [mem 0x0000000000600000-0x00000000003f4fffffff] usable
```

```
[ 0.000000] BIOS-e820: [mem 0x000000003f500000-0x000000003fffffff]
reserved
[ 0.000000] BIOS-e820: [mem 0x00000000fec00000-0x00000000fec00fff]
reserved
[ 0.000000] BIOS-e820: [mem 0x00000000fec04000-0x00000000fec07fff]
reserved
[ 0.000000] BIOS-e820: [mem 0x00000000fee00000-0x00000000fee00fff]
reserved
[ 0.000000] BIOS-e820: [mem 0x00000000ff000000-0x00000000ffffffff]
reserved
[ 0.000000] NX (Execute Disable) protection: active
[ 0.000000] SMBIOS 2.6 present.
[ 0.000000] DMI: Intel Corporation Merrifield/B0DEGA BAY, BIOS 466
2014.06.23:19.20.05
[ 0.000000] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
[ 0.000000] e820: remove [mem 0x000a0000-0x000fffff] usable
[ 0.000000] e820: last_pfn = 0x3f500 max_arch_pfn = 0x1000000
[ 0.000000] MTRR default type: uncachable
[ 0.000000] MTRR fixed ranges enabled:
[ 0.000000]   00000-9FFFF write-back
[ 0.000000]   A0000-BFFFF uncachable
[ 0.000000]   C0000-FFFFFF write-back
[ 0.000000] MTRR variable ranges enabled:
[ 0.000000]   0 base 000000000 mask FC0000000 write-back
[ 0.000000]   1 base 03F600000 mask FFFE00000 uncachable
[ 0.000000]   2 base 03F800000 mask FFF800000 uncachable
[ 0.000000]   3 base 004000000 mask FFE000000 uncachable
[ 0.000000]   4 disabled
[ 0.000000]   5 disabled
[ 0.000000]   6 disabled
[ 0.000000]   7 disabled
[ 0.000000] x86 PAT enabled: cpu 0, old 0x7040600070406, new
0x7010600070106
[ 0.000000] original variable MTRRs
[ 0.000000] reg 0, base: 0GB, range: 1GB, type WB
[ 0.000000] reg 1, base: 1014MB, range: 2MB, type UC
[ 0.000000] reg 2, base: 1016MB, range: 8MB, type UC
[ 0.000000] reg 3, base: 64MB, range: 32MB, type UC
[ 0.000000] total RAM covered: 982M
[ 0.000000] Found optimal setting for mtrr clean up
[ 0.000000] gran_size: 64K chunk_size: 512M num_reg: 5 lose
cover RAM: 0G
[ 0.000000] New variable MTRRs
[ 0.000000] reg 0, base: 0GB, range: 512MB, type WB
[ 0.000000] reg 1, base: 64MB, range: 32MB, type UC
[ 0.000000] reg 2, base: 512MB, range: 512MB, type WB
[ 0.000000] reg 3, base: 1014MB, range: 2MB, type UC
[ 0.000000] reg 4, base: 1016MB, range: 8MB, type UC
[ 0.000000] e820: update [mem 0x04000000-0x05fffffff] usable ==> reserved
[ 0.000000] initial memory mapped: [mem 0x00000000-0x021ffffff]
[ 0.000000] Base memory trampoline at [c0094000] 94000 size 16384
```

```

[ 0.000000] init_memory_mapping: [mem 0x00000000-0x000fffff]
[ 0.000000] [mem 0x00000000-0x000fffff] page 4k
[ 0.000000] init_memory_mapping: [mem 0x37800000-0x379fffff]
[ 0.000000] [mem 0x37800000-0x379fffff] page 2M
[ 0.000000] init_memory_mapping: [mem 0x34000000-0x377fffff]
[ 0.000000] [mem 0x34000000-0x377fffff] page 2M
[ 0.000000] init_memory_mapping: [mem 0x00100000-0x03ffffff]
[ 0.000000] [mem 0x00100000-0x001fffff] page 4k
[ 0.000000] [mem 0x00200000-0x03ffffff] page 2M
[ 0.000000] init_memory_mapping: [mem 0x06000000-0x33ffffff]
[ 0.000000] [mem 0x06000000-0x33ffffff] page 2M
[ 0.000000] init_memory_mapping: [mem 0x37a00000-0x37bfffff]
[ 0.000000] [mem 0x37a00000-0x37bfffff] page 4k
[ 0.000000] BRK [0x01d3f000, 0x01d3ffff] PGTABLE
[ 0.000000] 121MB HIGHMEM available.
[ 0.000000] 891MB LOWMEM available.
[ 0.000000] mapped low ram: 0 - 37bfe000
[ 0.000000] low ram: 0 - 37bfe000
[ 0.000000] BRK [0x01d40000, 0x01d40fff] PGTABLE
[ 0.000000] Zone ranges:
[ 0.000000] DMA [mem 0x00001000-0x00ffffff]
[ 0.000000] Normal [mem 0x01000000-0x37bfffff]
[ 0.000000] HighMem [mem 0x37bfe000-0x3f4ffffff]
[ 0.000000] Movable zone start for each node
[ 0.000000] Early memory node ranges
[ 0.000000] node 0: [mem 0x00001000-0x00097fff]
[ 0.000000] node 0: [mem 0x00100000-0x03ffffff]
[ 0.000000] node 0: [mem 0x06000000-0x3f4ffffff]
[ 0.000000] On node 0 totalpages: 251031
[ 0.000000] free_area_init_node: node 0, pgdat c1b6b580, node_mem_map
f740e020
[ 0.000000] DMA zone: 32 pages used for memmap
[ 0.000000] DMA zone: 0 pages reserved
[ 0.000000] DMA zone: 3991 pages, LIFO batch:0
[ 0.000000] Normal zone: 1752 pages used for memmap
[ 0.000000] Normal zone: 216062 pages, LIFO batch:31
[ 0.000000] HighMem zone: 243 pages used for memmap
[ 0.000000] HighMem zone: 30978 pages, LIFO batch:7
[ 0.000000] Using APIC driver default
[ 0.000000] SFI: Simple Firmware Interface v0.81
http://simplefirmware.org
[ 0.000000] SFI: SYST E61F0, 0060 (v1 INTEL INTELFDK)
[ 0.000000] SFI: CPUS E6296, 0020 (v1 INTEL INTELFDK)
[ 0.000000] SFI: FREQ E62C2, 0030 (v1 INTEL INTELFDK)
[ 0.000000] SFI: MMAP E62FE, 01A4 (v1 INTEL INTELFDK)
[ 0.000000] SFI: XSDT E64B0, 002C (v1 INTEL INTELFDK)
[ 0.000000] SFI: APIC E653E, 0020 (v1 INTEL INTELFDK)
[ 0.000000] SFI: WAKE E656A, 0020 (v2 INTEL INTELFDK)
[ 0.000000] SFI: DEVS E659E, 044B (v1 INTEL INTELFDK)
[ 0.000000] SFI: GPIO E69F5, 0964 (v1 INTEL INTELFDK)
[ 0.000000] SFI: OEMB E7365, 0060 (v5 UMGFDK CFGINFO!)

```

```
[ 0.000000] SFI: registering lapic[0]
[ 0.000000] SFI: registering lapic[2]
[ 0.000000] IOAPIC[0]: apic_id 0, version 32, address 0xfec00000, GSI
0-54
[ 0.000000] smpboot: Allowing 2 CPUs, 0 hotplug CPUs
[ 0.000000] nr_irqs_gsi: 71
[ 0.000000] e820: [mem 0x40000000-0xfebfffff] available for PCI devices
[ 0.000000] setup_percpu: NR_CPUS:2 nr_cpumask_bits:2 nr_cpu_ids:2
nr_node_ids:1
[ 0.000000] PERCPU: Embedded 14 pages/cpu @f73e8000 s33408 r0 d23936
u57344
[ 0.000000] pcpu-alloc: s33408 r0 d23936 u57344 alloc=14*4096
[ 0.000000] pcpu-alloc: [0] 0 [0] 1
[ 0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total
pages: 249247
[ 0.000000] Kernel command line:
root=PARTUUID=012b3303-34ac-284d-99b4-34e03a2335f4 rootfstype=ext4
console=ttyMFD2 earlyprintk=ttyMFD2,keep loglevel=4 systemd.unit=multi-
user.target hardware_id=00
g_multi.iSerialNumber=1beadedd24d38be574883e09dfdd115d
g_multi.dev_addr=02:00:86:dd:11:5d
[ 0.000000] PID hash table entries: 4096 (order: 2, 16384 bytes)
[ 0.000000] Dentry cache hash table entries: 131072 (order: 7, 524288
bytes)
[ 0.000000] Inode-cache hash table entries: 65536 (order: 6, 262144
bytes)
[ 0.000000] Initializing CPU#0
[ 0.000000] Initializing HighMem for node 0 (00037bfe:0003f500)
[ 0.000000] Memory: 983448k/1037312k available (6581k kernel code, 20676k
reserved, 3194k data, 624k init, 123912k highmem)
[ 0.000000] virtual kernel memory layout:
[ 0.000000]   fixmap   : 0xffff8b000 - 0xfffff000   ( 464 kB)
[ 0.000000]   pkmap    : 0xffc00000 - 0xffe00000   (2048 kB)
[ 0.000000]   vmalloc   : 0xf83fe000 - 0xffbfe000   ( 120 MB)
[ 0.000000]   lowmem    : 0xc0000000 - 0xf7bfe000   ( 891 MB)
[ 0.000000]     .init    : 0xc1b8c000 - 0xc1c28000   ( 624 kB)
[ 0.000000]     .data    : 0xc186d638 - 0xc1b8bfc0   (3194 kB)
[ 0.000000]     .text    : 0xc1200000 - 0xc186d638   (6581 kB)
[ 0.000000] Checking if this processor honours the WP bit even in
supervisor mode...Ok.
[ 0.000000] SLUB: HWalign=64, Order=0-3, MinObjects=0, CPUs=2, Nodes=1
[ 0.000000] Preemptible hierarchical RCU implementation.
[ 0.000000] Additional per-CPU info printed with stalls.
[ 0.000000] NR_IRQS:2304 nr_irqs:512 16
[ 0.000000] CPU 0 irqstacks, hard=f6c08000 soft=f6c0a000
[ 0.000000] Console: colour dummy device 80x25
[ 0.000000] kmemleak: Kernel memory leak detector disabled
[ 0.000000] tsc: Detected 499.200 MHz processor
[ 0.000008] Calibrating delay loop (skipped), value calculated using
timer frequency.. 998.40 BogoMIPS (lpj=4992000)
[ 0.000031] pid_max: default: 32768 minimum: 301
```



```

[ 0.000265] Security Framework initialized
[ 0.000295] SELinux: Initializing.
[ 0.000357] SELinux: Starting in permissive mode
[ 0.000439] Mount-cache hash table entries: 512
[ 0.001639] Initializing cgroup subsys devices
[ 0.001664] Initializing cgroup subsys freezer
[ 0.001681] Initializing cgroup subsys blkio
[ 0.001696] Initializing cgroup subsys perf_event
[ 0.001843] CPU: Physical Processor ID: 0
[ 0.001858] CPU: Processor Core ID: 0
[ 0.001877] ENERGY_PERF_BIAS: Set to 'normal', was 'performance'
[ 0.001877] ENERGY_PERF_BIAS: View and update with
x86_energy_perf_policy(8)
[ 0.001897] mce: CPU supports 6 MCE banks
[ 0.001928] CPU0: Thermal monitoring enabled (TM1)
[ 0.001972] Last level iTLB entries: 4KB 0, 2MB 0, 4MB 0
[ 0.001972] Last level dTLB entries: 4KB 128, 2MB 0, 4MB 0
[ 0.001972] tlb_flushall_shift: 6
[ 0.002477] Freeing SMP alternatives: 28k freed
[ 0.002532] SFI: MCFG E64F6, 003C (v1 INTEL INTELFDK)
[ 0.002551] ftrace: allocating 26832 entries in 53 pages
[ 0.068521] Enabling APIC mode: Flat. Using 1 I/O APICs
[ 0.068603] smpboot: CPU0: Genuine Intel(R) CPU 4000 @ 500MHz (fam:
06, model: 4a, stepping: 08)
[ 0.068653] TSC deadline timer enabled
[ 0.068715] Performance Events: no PEBS fmt2+, generic architected
perfmon, Intel PMU driver.
[ 0.068760] ... version: 3
[ 0.068774] ... bit width: 40
[ 0.068786] ... generic registers: 2
[ 0.068800] ... value mask: 000000ffffffffffff
[ 0.068813] ... max period: 000000007fffffffff
[ 0.068825] ... fixed-purpose events: 3
[ 0.068837] ... event mask: 00000000700000003
[ 0.109195] ftrace: Allocated trace_printk buffers
[ 0.160243] CPU 1 irqstacks, hard=f6f8a000 soft=f6f8c000
[ 0.160263] smpboot: Booting Node 0, Processors #1 OK
[ 0.170478] Initializing CPU#1
[ 0.171433] Skipped synchronization checks as TSC is reliable.
[ 0.171860] NMI watchdog: enabled on all CPUs, permanently consumes one
hw-PMU counter.
[ 0.171943] Brought up 2 CPUs
[ 0.171964] smpboot: Total of 2 processors activated (1996.80 BogoMIPS)
[ 0.173950] devtmpfs: initialized
[ 0.184321] SFI: SFI sysfs interfaces init success
[ 0.184923] regulator-dummy: no parameters
[ 0.185427] NET: Registered protocol family 16
[ 0.187244] SFI OEMB Layout
[ 0.187282] OEMB signature : OEMB
[ 0.187282] OEMB length : 96
[ 0.187282] OEMB revision : 5

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```
[ 0.187282] OEMB checksum : 0x9F
[ 0.187282] OEMB oem_id : UMGFDK
[ 0.187282] OEMB oem_table_id : CFGINFO!
[ 0.187282] OEMB board_id : 0x02
[ 0.187282] OEMB ia fw version : 002.001
[ 0.187282] OEMB val_hooks version : 002.001
[ 0.187282] OEMB ia suppfw version : 000.000
[ 0.187282] OEMB scu runtime version : 176.073
[ 0.187282] OEMB ifwi version : 237.011
[ 0.187384] intel_soc_thermal: IPC bus = 0, name = soc_thrm, irq
= 0x 1
[ 0.187597] IPC bus, name = bcove_adc, irq = 0x32
[ 0.187814] IPC bus, name = bcove_thrm, irq = 0x34
[ 0.188029] IPC bus, name = bcove_power_btn, irq = 0x1e
[ 0.188206] IPC bus, name = pmic_ccsm, irq = 0x1b
[ 0.188349] IPC bus, name = i2c_pmic_adap, irq = 0x1b
[ 0.188601] SDIO bus = 1, name = bcm43xx_clk_vmmc, ref_clock = 26000000,
addr =0x401
[ 0.188617] Using generic wifi platform data
[ 0.188634] wifi_platform_data: GPIO == 64
[ 0.188771] IPC bus, name = msic_gpio, irq = 0x31
[ 0.188956] I2C bus = 1, name = pcal9555a-1, irq = 0x 0, addr = 0x20
[ 0.188993] I2C bus = 1, name = pcal9555a-2, irq = 0x 0, addr = 0x21
[ 0.189025] I2C bus = 1, name = pcal9555a-3, irq = 0x 0, addr = 0x22
[ 0.189057] I2C bus = 1, name = pcal9555a-4, irq = 0x 0, addr = 0x23
[ 0.189089] SPI bus=5, name= ads7955, irq=0x 0,
max_freq=20000000, cs=0
[ 0.189113] SPI bus=5, name= spidev, irq=0x 0,
max_freq=25000000, cs=1
[ 0.189166] pgrr = 000003d5
[ 0.189668] PCI: MMCONFIG for domain 0000 [bus 00-00] at [mem
0x3f500000-0x3f5fffff] (base 0x3f500000)
[ 0.189693] PCI: MMCONFIG at [mem 0x3f500000-0x3f5fffff] reserved in E820
[ 0.189707] PCI: Using MMCONFIG for extended config space
[ 0.189720] PCI: Using configuration type 1 for base access
[ 0.202128] bio: create slab <bio-0> at 0
[ 0.203475] vgaarb: loaded
[ 0.204179] SCSI subsystem initialized
[ 0.204535] usbcore: registered new interface driver usbfs
[ 0.204633] usbcore: registered new interface driver hub
[ 0.204842] usbcore: registered new device driver usb
[ 0.205169] media: Linux media interface: v0.10
[ 0.205250] Linux video capture interface: v2.00
[ 0.205321] pps_core: LinuxPPS API ver. 1 registered
[ 0.205337] pps_core: Software ver. 5.3.6 - Copyright 2005-2007 Rodolfo
Giometti <giometti@linux.it>
[ 0.205377] PTP clock support registered
[ 0.205883] remoteproc0: intel_rproc_scu is available
[ 0.205904] remoteproc0: Note: remoteproc is still under development and
considered experimental.
[ 0.205919] remoteproc0: THE BINARY FORMAT IS NOT YET FINALIZED, and
```

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backward compatibility isn't yet guaranteed.
[ 0.206343] remoteproc0: registered virtio0 (type 7)
[ 0.206603] remoteproc0: powering up intel_rproc_scu
[ 0.206630] remoteproc0: Booting fw image
intel_mid/intel_mid_remoteproc.fw, size 4456
[ 0.206670] Started intel scu remote processor
[ 0.206687] remoteproc0: remote processor intel_rproc_scu is now up
[ 0.207024] virtio_rpmsg_bus virtio0: creating channel rpmsg_bcove_adc
addr 0x24
[ 0.207207] virtio_rpmsg_bus virtio0: creating channel rpmsg_mrfl_thermal
addr 0x25
[ 0.207384] virtio_rpmsg_bus virtio0: creating channel rpmsg_mid_powerbtn
addr 0x10
[ 0.207557] virtio_rpmsg_bus virtio0: creating channel rpmsg_pmic_ccsm
addr 0x19
[ 0.207744] virtio_rpmsg_bus virtio0: creating channel
rpmsg_i2c_pmic_adap addr 0x20
[ 0.207919] virtio_rpmsg_bus virtio0: creating channel rpmsg_msic_gpio
addr 0x5
[ 0.208092] virtio_rpmsg_bus virtio0: creating channel rpmsg_ipc_command
addr 0xa0
[ 0.208278] virtio_rpmsg_bus virtio0: creating channel
rpmsg_ipc_simple_command addr 0xa1
[ 0.208456] virtio_rpmsg_bus virtio0: creating channel
rpmsg_ipc_raw_command addr 0xa2
[ 0.208630] virtio_rpmsg_bus virtio0: creating channel rpmsg_pmic addr
0xff
[ 0.208816] virtio_rpmsg_bus virtio0: creating channel rpmsg_mip addr
0xec
[ 0.208993] virtio_rpmsg_bus virtio0: creating channel rpmsg_fw_update
addr 0x13
[ 0.209170] virtio_rpmsg_bus virtio0: creating channel rpmsg_ipc_util
addr 0x12
[ 0.209348] virtio_rpmsg_bus virtio0: creating channel rpmsg_flis addr
0xf5
[ 0.209537] virtio_rpmsg_bus virtio0: creating channel rpmsg_watchdog
addr 0xf8
[ 0.209730] virtio_rpmsg_bus virtio0: creating channel rpmsg_umip addr
0x14
[ 0.209910] virtio_rpmsg_bus virtio0: creating channel rpmsg_osip addr
0x15
[ 0.210102] virtio_rpmsg_bus virtio0: creating channel rpmsg_vrtc addr
0xfa
[ 0.210285] virtio_rpmsg_bus virtio0: creating channel rpmsg_fw_logging
addr 0x27
[ 0.210468] virtio_rpmsg_bus virtio0: creating channel rpmsg_kpd_led addr
0x23
[ 0.210652] virtio_rpmsg_bus virtio0: creating channel rpmsg_modem_nvram
addr 0xa2
[ 0.210847] virtio_rpmsg_bus virtio0: creating channel rpmsg_mid_pwm addr
0x22
```

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[ 0.211033] virtio_rpmsg_bus virtio0: rpmsg host is online
[ 0.211150] intel_mid_rpmsg rpmsg6: Probed rpmsg_ipc device
rpmsg_ipc_command
[ 0.211172] intel_mid_rpmsg rpmsg6: Allocating rpmsg_instance
[ 0.211226] intel_mid_rpmsg rpmsg7: Probed rpmsg_ipc device
rpmsg_ipc_simple_command
[ 0.211246] intel_mid_rpmsg rpmsg7: Allocating rpmsg_instance
[ 0.211298] intel_mid_rpmsg rpmsg8: Probed rpmsg_ipc device
rpmsg_ipc_raw_command
[ 0.211318] intel_mid_rpmsg rpmsg8: Allocating rpmsg_instance
[ 0.211896] Advanced Linux Sound Architecture Driver Initialized.
[ 0.211915] Intel MID platform detected, using MID PCI ops
[ 0.211928] PCI: Probing PCI hardware
[ 0.211944] PCI: root bus 00: using default resources
[ 0.211959] PCI: Probing PCI hardware (bus 00)
[ 0.212204] PCI host bridge to bus 0000:00
[ 0.212234] pci_bus 0000:00: root bus resource [io 0x0000-0xffff]
[ 0.212258] pci_bus 0000:00: root bus resource [mem
0x00000000-0xffffffff]
[ 0.212277] pci_bus 0000:00: No busn resource found for root bus, will
use [bus 00-ff]
[ 0.212336] pci 0000:00:00.0: [8086:1170] type 00 class 0x060000
[ 0.212759] pci 0000:00:01.0: [8086:1190] type 00 class 0x080501
[ 0.212831] pci 0000:00:01.0: reg 10: [mem 0xff3fc000-0xff3fc0ff]
[ 0.213046] pci 0000:00:01.0: PME# supported from D0 D3hot
[ 0.213388] pci 0000:00:01.2: [8086:1190] type 00 class 0x080501
[ 0.213456] pci 0000:00:01.2: reg 10: [mem 0xff3fa000-0xff3fa0ff]
[ 0.213669] pci 0000:00:01.2: PME# supported from D0 D3hot
[ 0.214017] pci 0000:00:01.3: [8086:1190] type 00 class 0x080501
[ 0.214084] pci 0000:00:01.3: reg 10: [mem 0xff3fb000-0xff3fb0ff]
[ 0.214297] pci 0000:00:01.3: PME# supported from D0 D3hot
[ 0.214648] pci 0000:00:02.0: [8086:1182] type 00 class 0x038000
[ 0.214718] pci 0000:00:02.0: reg 10: [mem 0xc0000000-0xc1ffffff]
[ 0.214779] pci 0000:00:02.0: reg 18: [mem 0x80000000-0x8fffffff]
[ 0.214839] pci 0000:00:02.0: reg 20: [io 0x7ff8-0x7fff]
[ 0.215272] pci 0000:00:04.0: [8086:1191] type 00 class 0x070002
[ 0.215338] pci 0000:00:04.0: reg 10: [mem 0xff010000-0xff01007f]
[ 0.215550] pci 0000:00:04.0: PME# supported from D0 D3hot
[ 0.215899] pci 0000:00:04.1: [8086:1191] type 00 class 0x070002
[ 0.215967] pci 0000:00:04.1: reg 10: [mem 0xff010080-0xff0100ff]
[ 0.216179] pci 0000:00:04.1: PME# supported from D0 D3hot
[ 0.216518] pci 0000:00:04.2: [8086:1191] type 00 class 0x070002
[ 0.216585] pci 0000:00:04.2: reg 10: [mem 0xff010100-0xff01017f]
[ 0.216797] pci 0000:00:04.2: PME# supported from D0 D3hot
[ 0.217155] pci 0000:00:04.3: [8086:1191] type 00 class 0x070002
[ 0.217222] pci 0000:00:04.3: reg 10: [mem 0xff010180-0xff0101ff]
[ 0.217435] pci 0000:00:04.3: PME# supported from D0 D3hot
[ 0.217783] pci 0000:00:05.0: [8086:1192] type 00 class 0x070002
[ 0.217850] pci 0000:00:05.0: reg 10: [mem 0xff010400-0xff0107ff]
[ 0.218062] pci 0000:00:05.0: PME# supported from D0 D3hot
[ 0.218411] pci 0000:00:06.0: [8086:1193] type 00 class 0x088000
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[ 0.218479] pci 0000:00:06.0: reg 10: [mem 0xff2a0000-0xff2a0fff]
[ 0.218691] pci 0000:00:06.0: PME# supported from D0 D3hot
[ 0.219041] pci 0000:00:06.1: [8086:1193] type 00 class 0x088000
[ 0.219110] pci 0000:00:06.1: reg 10: [mem 0xff2a1000-0xff2a1fff]
[ 0.219322] pci 0000:00:06.1: PME# supported from D0 D3hot
[ 0.219717] pci 0000:00:07.0: [8086:1194] type 00 class 0x088000
[ 0.219786] pci 0000:00:07.0: reg 10: [mem 0xff188000-0xff188fff]
[ 0.219998] pci 0000:00:07.0: PME# supported from D0 D3hot
[ 0.220353] pci 0000:00:07.1: [8086:1194] type 00 class 0x088000
[ 0.220421] pci 0000:00:07.1: reg 10: [mem 0xff189000-0xff189fff]
[ 0.220633] pci 0000:00:07.1: PME# supported from D0 D3hot
[ 0.220978] pci 0000:00:07.2: [8086:1194] type 00 class 0x088000
[ 0.221046] pci 0000:00:07.2: reg 10: [mem 0xff18a000-0xff18afff]
[ 0.221257] pci 0000:00:07.2: PME# supported from D0 D3hot
[ 0.221645] pci 0000:00:08.0: [8086:1195] type 00 class 0x078000
[ 0.221714] pci 0000:00:08.0: reg 10: [mem 0xff18b000-0xff18bfff]
[ 0.221926] pci 0000:00:08.0: PME# supported from D0 D3hot
[ 0.222274] pci 0000:00:08.1: [8086:1195] type 00 class 0x078000
[ 0.222341] pci 0000:00:08.1: reg 10: [mem 0xff18c000-0xff18cfff]
[ 0.222554] pci 0000:00:08.1: PME# supported from D0 D3hot
[ 0.222889] pci 0000:00:08.2: [8086:1195] type 00 class 0x078000
[ 0.222957] pci 0000:00:08.2: reg 10: [mem 0xff18d000-0xff18dfff]
[ 0.223169] pci 0000:00:08.2: PME# supported from D0 D3hot
[ 0.223515] pci 0000:00:08.3: [8086:1195] type 00 class 0x078000
[ 0.223583] pci 0000:00:08.3: reg 10: [mem 0xff18e000-0xff18efff]
[ 0.223796] pci 0000:00:08.3: PME# supported from D0 D3hot
[ 0.224156] pci 0000:00:09.0: [8086:1196] type 00 class 0x078000
[ 0.224223] pci 0000:00:09.0: reg 10: [mem 0xff18f000-0xff18ffff]
[ 0.224435] pci 0000:00:09.0: PME# supported from D0 D3hot
[ 0.224770] pci 0000:00:09.1: [8086:1196] type 00 class 0x078000
[ 0.224838] pci 0000:00:09.1: reg 10: [mem 0xff190000-0xff190fff]
[ 0.225050] pci 0000:00:09.1: PME# supported from D0 D3hot
[ 0.225398] pci 0000:00:09.2: [8086:1196] type 00 class 0x078000
[ 0.225465] pci 0000:00:09.2: reg 10: [mem 0xff191000-0xff191fff]
[ 0.225677] pci 0000:00:09.2: PME# supported from D0 D3hot
[ 0.226043] pci 0000:00:0a.0: [8086:1197] type 00 class 0x078000
[ 0.226110] pci 0000:00:0a.0: reg 10: [mem 0xff3f8000-0xff3f8fff]
[ 0.226323] pci 0000:00:0a.0: PME# supported from D0 D3hot
[ 0.226661] pci 0000:00:0b.0: [8086:1198] type 00 class 0x108000
[ 0.226728] pci 0000:00:0b.0: reg 10: [mem 0xf9038000-0xf903ffff]
[ 0.226939] pci 0000:00:0b.0: PME# supported from D0 D3hot
[ 0.227287] pci 0000:00:0c.0: [8086:1199] type 00 class 0x088000
[ 0.227355] pci 0000:00:0c.0: reg 10: [mem 0xff008000-0xff008fff]
[ 0.227398] pci 0000:00:0c.0: reg 14: [mem 0x000df570-0x000df57f]
[ 0.227590] pci 0000:00:0c.0: PME# supported from D0 D3hot
[ 0.227929] pci 0000:00:0d.0: [8086:119a] type 00 class 0x040100
[ 0.227996] pci 0000:00:0d.0: reg 10: [mem 0x05e00000-0x05ffffff]
[ 0.228039] pci 0000:00:0d.0: reg 14: [mem 0xff340000-0xff343fff]
[ 0.228080] pci 0000:00:0d.0: reg 18: [mem 0xff344000-0xff344fff]
[ 0.228121] pci 0000:00:0d.0: reg 1c: [mem 0xff2c0000-0xff2dffff]
[ 0.228161] pci 0000:00:0d.0: reg 20: [mem 0xff300000-0xff33ffff]
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[ 0.228299] pci 0000:00:0d.0: PME# supported from D0 D3hot
[ 0.228651] pci 0000:00:0e.0: [8086:119b] type 00 class 0x088000
[ 0.228719] pci 0000:00:0e.0: reg 10: [mem 0xff298000-0xff29bfff]
[ 0.228761] pci 0000:00:0e.0: reg 14: [mem 0xff2a2000-0xff2a2fff]
[ 0.228954] pci 0000:00:0e.0: PME# supported from D0 D3hot
[ 0.229314] pci 0000:00:11.0: [8086:119e] type 00 class 0x0c0320
[ 0.229428] pci 0000:00:11.0: reg 10: [mem 0xf9100000-0xf911ffff]
[ 0.229644] pci 0000:00:11.0: PME# supported from D0 D3hot
[ 0.229987] pci 0000:00:12.0: [8086:119f] type 00 class 0x118000
[ 0.230054] pci 0000:00:12.0: reg 10: [mem 0xf9009000-0xf9009fff]
[ 0.230097] pci 0000:00:12.0: reg 14: [mem 0xf90a0000-0xf90affff]
[ 0.230138] pci 0000:00:12.0: reg 18: [mem 0xfa000000-0xfaffffff]
[ 0.230313] pci 0000:00:12.0: PME# supported from D0 D3hot
[ 0.230677] pci 0000:00:13.0: [8086:11a0] type 00 class 0x0b4000
[ 0.230744] pci 0000:00:13.0: reg 10: [mem 0xff009000-0xff009fff]
[ 0.230955] pci 0000:00:13.0: PME# supported from D0 D3hot
[ 0.231307] pci 0000:00:14.0: [8086:11a1] type 00 class 0x0b4000
[ 0.231375] pci 0000:00:14.0: reg 10: [mem 0xff00b000-0xff00bfff]
[ 0.231622] pci 0000:00:14.0: PME# supported from D0 D3hot
[ 0.231970] pci 0000:00:15.0: [8086:11a2] type 00 class 0x088000
[ 0.232038] pci 0000:00:15.0: reg 10: [mem 0xff192000-0xff192fff]
[ 0.232250] pci 0000:00:15.0: PME# supported from D0 D3hot
[ 0.232603] pci 0000:00:16.0: [8086:11a3] type 00 class 0x0b4000
[ 0.232671] pci 0000:00:16.0: reg 10: [mem 0xff0d9000-0xff0d90ff]
[ 0.232883] pci 0000:00:16.0: PME# supported from D0 D3hot
[ 0.233225] pci 0000:00:16.1: [8086:11a4] type 00 class 0x0b4000
[ 0.233292] pci 0000:00:16.1: reg 10: [mem 0x04819000-0x04898fff]
[ 0.233335] pci 0000:00:16.1: reg 14: [mem 0x04919000-0x04920fff]
[ 0.233528] pci 0000:00:16.1: PME# supported from D0 D3hot
[ 0.233906] pci 0000:00:17.0: [8086:11a5] type 00 class 0x088000
[ 0.233972] pci 0000:00:17.0: reg 10: [mem 0xff013000-0xff013fff]
[ 0.234184] pci 0000:00:17.0: PME# supported from D0 D3hot
[ 0.234565] pci 0000:00:18.0: [8086:11a6] type 00 class 0x038000
[ 0.234817] pci 0000:00:18.0: PME# supported from D0 D3hot
[ 0.235193] pci_bus 0000:00: busn_res: [bus 00-ff] end is updated to 00
[ 0.235361] PCI: pci_cache_line_size set to 64 bytes
[ 0.235639] e820: reserve RAM buffer [mem 0x00098000-0x0009ffff]
[ 0.235661] e820: reserve RAM buffer [mem 0x3f500000-0x3fffffff]
[ 0.236449] Bluetooth: Core ver 2.16
[ 0.236532] NET: Registered protocol family 31
[ 0.236549] Bluetooth: HCI device and connection manager initialized
[ 0.236579] Bluetooth: HCI socket layer initialized
[ 0.236606] Bluetooth: L2CAP socket layer initialized
[ 0.236702] Bluetooth: SCO socket layer initialized
[ 0.237401] cfg80211: Calling CRDA to update world regulatory domain
[ 0.238458] intel_scu_flis platform device created
[ 0.238537] hsu core clock 38 M
[ 0.238712] intel_pmu_driver 0000:00:14.0: PMU DRIVER Probe called
[ 0.240054] intel_pmu_driver 0000:00:14.0: after pmu initialization
[ 0.240186] Switching to clocksource refined-jiffies
[ 0.499737] intel_scu_flis rpmsg13: Probed flis rpmsg device
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[ 0.499765] intel_scu_flis rpmsg13: Allocating rpmsg_instance
[ 0.499972] intel_scu_flis intel_scu_flis: scu flis probed
[ 0.500123] pci_bus 0000:00: resource 4 [io 0x0000-0xffff]
[ 0.500148] pci_bus 0000:00: resource 5 [mem 0x00000000-0xffffffff]
[ 0.500396] NET: Registered protocol family 2
[ 0.501435] TCP established hash table entries: 8192 (order: 4, 65536
bytes)
[ 0.501643] TCP bind hash table entries: 8192 (order: 5, 163840 bytes)
[ 0.501938] TCP: Hash tables configured (established 8192 bind 8192)
[ 0.502033] TCP: reno registered
[ 0.502063] UDP hash table entries: 512 (order: 2, 24576 bytes)
[ 0.502131] UDP-Lite hash table entries: 512 (order: 2, 24576 bytes)
[ 0.502575] NET: Registered protocol family 1
[ 0.503126] RPC: Registered named UNIX socket transport module.
[ 0.503146] RPC: Registered udp transport module.
[ 0.503159] RPC: Registered tcp transport module.
[ 0.503171] RPC: Registered tcp NFSv4.1 backchannel transport module.
[ 0.505692] PCI: CLS 0 bytes, default 64
[ 0.505779] intel_scu_pmic rpmsg9: Probed pmic rpmsg device
[ 0.505801] intel_scu_pmic rpmsg9: Allocating rpmsg_instance
[ 0.506431] intel_scu_watchdog_evo rpmsg14: Probed watchdog rpmsg device
[ 0.506454] intel_scu_watchdog_evo rpmsg14: Allocating rpmsg_instance
[ 0.507134] intel_scu_ipcutil rpmsg12: Probed ipcutil rpmsg device
[ 0.507157] intel_scu_ipcutil rpmsg12: Allocating rpmsg_instance
[ 0.507300] (oshob) base addr = 0xfffff000
[ 0.507316] (oshob) identified platform = INTEL_MID_CPU_CHIP_TANGIER
[ 0.507332] (oshob) oshob version = 1.4
[ 0.507384] (latest extend oshob) osnib ptr = 0xfffff800
[ 0.507398] Using latest extended oshob structure size = 1024 bytes
[ 0.507412] OSNIB Intel size = 32 bytes OEMNIB size = 96 bytes
[ 0.507426] (extend oshob) SCU buffer size is 16 bytes
[ 0.507492] [BOOT] RESETSRC0=0x00 RESETSRC1=0x00 (PMIT interrupt tree)
[ 0.507566] [BOOT] SCU_TR[0]=0x00020001
[ 0.507581] [BOOT] SCU_TR[1]=0x00000220
[ 0.507595] [BOOT] SCU_TR[2]=0x00000000
[ 0.507607] [BOOT] SCU_TR[3]=0x00000000
[ 0.507619] [BOOT] IA_TR=0x00000000 (oshob)
[ 0.507958] [BOOT] RR=[fastboot] WD=0x00 ALARM=0x00 (osnib)
[ 0.507973] [BOOT] WAKESRC=[no matching osip entry] (osnib)
[ 0.507988] [BOOT] RESETSRC0=0x00 RESETSRC1=0x00 (osnib)
[ 0.508057] OEMNIB interface registered to debugfs
[ 0.508427] iio_basincove_gpadc rpmsg0: Probed bcove_gpadc rpmsg device
[ 0.509117] bcove_adc bcove_adc: bcove adc probed
[ 0.509960] platform rtc_cmos: registered platform RTC device (no PNP
device found)
[ 0.512041] cryptomgr_test (29) used greatest stack depth: 7548 bytes
left
[ 0.514487] vprog1: 1500 <--> 2800 mV at 2800 mV normal
[ 0.515215] vprog2: 1500 <--> 2850 mV at 2850 mV normal
[ 0.515918] vprog3: 1050 <--> 2800 mV at 1050 mV normal
[ 0.517241] audit: initializing netlink socket (disabled)
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[ 0.517305] type=2000 audit(946685153.440:1): initialized
[ 0.658972] bounce pool size: 64 pages
[ 0.676747] NFS: Registering the id_resolver key type
[ 0.676828] Key type id_resolver registered
[ 0.676846] Key type id_legacy registered
[ 0.677212] fuse init (API version 7.22)
[ 0.678031] msgmni has been set to 1678
[ 0.678582] SELinux: Registering netfilter hooks
[ 0.679778] cryptomgr_test (46) used greatest stack depth: 7540 bytes
left
[ 0.680002] cryptomgr_test (47) used greatest stack depth: 7372 bytes
left
[ 0.681919] Key type asymmetric registered
[ 0.681940] Asymmetric key parser 'x509' registered
[ 0.682051] Block layer SCSI generic (bsg) driver version 0.4 loaded
(major 249)
[ 0.682335] io scheduler noop registered
[ 0.682634] io scheduler cfq registered (default)
[ 0.682653] list_sort_test: start testing list_sort()
[ 0.685896] intel_idle: MWAIT substates: 0x33000020
[ 0.685916] intel_idle: v0.4 model 0x4A
[ 0.685931] intel_idle: lapic_timer_reliable_states 0xffffffff
[ 0.686206] intel_mid_dma 0000:00:0e.0: setting latency timer to 64
[ 0.700476] intel_mid_dma 0000:00:15.0: setting latency timer to 64
[ 0.721342] HSU DMA 0000:00:05.0: FUNC: 0 driver: 5 addr:ff010400 len:400
[ 0.721618] HSU serial 0000:00:04.0: FUNC: 0 driver: 0 addr:ff010000
len:80
[ 0.721676] HSU serial 0000:00:04.1: FUNC: 1 driver: 0 addr:ff010080
len:80
[ 0.721765] Found a Intel HSU
[ 0.722684] 0000:00:04.1: ttyMFD0 at MMIO 0xff010080 (irq = 28) is a
hsu_bt_port_p
[ 0.723235] HSU serial 0000:00:04.2: FUNC: 2 driver: 0 addr:ff010100
len:80
[ 0.723324] Found a Intel HSU
[ 0.724165] 0000:00:04.2: ttyMFD1 at MMIO 0xff010100 (irq = 29) is a
hsu_gps_port_p
[ 0.724710] HSU serial 0000:00:04.3: FUNC: 3 driver: 0 addr:ff010180
len:80
[ 0.724796] Found a Intel HSU
[ 0.725487] 0000:00:04.3: ttyMFD2 at MMIO 0xff010180 (irq = 54) is a
hsu_debug_port_p
[ 0.733003] console [ttyMFD2] enabled
[ 0.734158] Non-volatile memory driver v1.3
[ 0.734890] Linux agpgart interface v0.103
[ 0.735404] [drm] Initialized drm 1.1.0 20060810
[ 0.749830] brd: module loaded
[ 0.757565] loop: module loaded
[ 0.760487] emmc_ipanic: init success
[ 0.761197] tun: Universal TUN/TAP device driver, 1.6
[ 0.761216] tun: (C) 1999-2004 Max Krasnyansky <maxk@qualcomm.com>
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[ 0.761624] usbcore: registered new interface driver asix
[ 0.761706] usbcore: registered new interface driver cdc_subset
[ 0.761848] usbcore: registered new interface driver cdc_ncm
[ 0.762115] dwc3_otg 0000:00:11.0: setting latency timer to 64
[ 0.764352] ehci_hcd: USB 2.0 'Enhanced' Host Controller (EHCI) Driver
[ 0.764675] usbcore: registered new interface driver cdc_acm
[ 0.764692] cdc_acm: USB Abstract Control Model driver for USB modems and
ISDN adapters
[ 0.764796] usbcore: registered new interface driver usb-storage
[ 0.764975] usbcore: registered new interface driver usbserial
[ 0.765066] usbcore: registered new interface driver pl2303
[ 0.765135] usbserial: USB Serial support registered for pl2303
[ 0.766043] rtc_cmos rtc_cmos: rtc core: registered rtc_cmos as rtc0
[ 0.766196] rtc_cmos rtc_cmos: alarms up to one day, 114 bytes nvram
[ 0.766253] i2c /dev entries driver
[ 0.910988] i2c_pmic rpmsg4: Probed pmic_i2c rpmsg device
[ 0.913193] coretemp: Enabled Aux0/Aux1 interrupts for coretemp
[ 0.913326] coretemp: Enabled Aux0/Aux1 interrupts for coretemp
[ 0.913416] bcove_thrm rpmsg1: Probed mrfl_thermal rpmsg device
[ 0.917597] thermal thermal_zone0: failed to read out thermal zone 0
[ 0.918184] thermal thermal_zone1: failed to read out thermal zone 1
[ 0.918760] thermal thermal_zone2: failed to read out thermal zone 2
[ 0.921302] Bluetooth: HCI UART driver ver 2.2
[ 0.921324] Bluetooth: HCI H4 protocol initialized
[ 0.921797] cpuidle: using governor ladder
[ 0.922432] cpuidle: using governor menu
[ 0.922504] sdhci: Secure Digital Host Controller Interface driver
[ 0.922560] sdhci: Copyright(c) Pierre Ossman
[ 0.922644] sdhci-pci 0000:00:01.0: SDHCI controller found [8086:1190]
(rev 1)
[ 0.922725] flis_addr mapped addr: f8496900
[ 0.922837] sdhci-pci 0000:00:01.0: rte_addr mapped addr: f849a000
[ 0.922898] sdhci-pci 0000:00:01.0: setting latency timer to 64
[ 0.922927] mmc0: no vqmmc regulator found
[ 1.015899] mmc0: BKOPS_EN bit is not set
[ 1.324571] mmc0: new HS200 MMC card at address 0001
[ 1.325474] mmcblk0: mmc0:0001 H4G1d 3.64 GiB
[ 1.325930] mmcblk0boot0: mmc0:0001 H4G1d partition 1 4.00 MiB
[ 1.326348] mmcblk0boot1: mmc0:0001 H4G1d partition 2 4.00 MiB
[ 1.326774] mmcblk0rpmb: mmc0:0001 H4G1d partition 3 4.00 MiB
[ 1.332647] mmcblk0: p1 p2 p3 p4 p5 p6 p7 p8 p9 p10
[ 1.341074] mmcblk0boot1: unknown partition table
[ 1.344843] mmcblk0boot0: unknown partition table
[ 1.345260] mmc0: SDHCI controller on PCI [0000:00:01.0] using ADMA
[ 1.361586] emmc_ipanic: panic partition found, label:panic,
device:mmcblk0p6
[ 1.504063] Switching to clocksource tsc
[ 1.542548] emmc_ipanic: emmc_panic_notify_add: bad magic 0, no data
available
[ 1.544231] sdhci-pci 0000:00:01.2: SDHCI controller found [8086:1190]
(rev 1)
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[ 1.574629] sdhci-pci 0000:00:01.2: setting latency timer to 64
[ 1.574669] mmc1: no vqmmc regulator found
[ 1.575073] mmc1: SDHCI controller on PCI [0000:00:01.2] using ADMA
[ 1.575262] sdhci-pci 0000:00:01.3: SDHCI controller found [8086:1190]
(rev 1)
[ 1.575383] vwlan gpio 96
[ 1.575784] vwlan: 1800 mV
[ 1.576009] sdhci-pci 0000:00:01.3: setting latency timer to 64
[ 1.576040] mmc2: no vqmmc regulator found
[ 1.576505] mmc2: SDHCI controller on PCI [0000:00:01.3] using ADMA
[ 1.585026] hidraw: raw HID events driver (C) Jiri Kosina
[ 1.585716] usbcore: registered new interface driver usbhid
[ 1.585736] usbhid: USB HID core driver
[ 1.585822] intel_scu_fw_update rpmsg11: Probed fw_update rpmsg device
[ 1.585843] intel_scu_fw_update rpmsg11: Allocating rpmsg_instance
[ 1.591204] oprofile: using NMI interrupt.
[ 1.591357] Netfilter messages via NETLINK v0.30.
[ 1.591453] nf_conntrack version 0.5.0 (15366 buckets, 61464 max)
[ 1.592354] NF_TPROXY: Transparent proxy support initialized, version
4.1.0
[ 1.592372] NF_TPROXY: Copyright (c) 2006-2007 BalaBit IT Ltd.
[ 1.592979] ip_tables: (C) 2000-2006 Netfilter Core Team
[ 1.593317] TCP: cubic registered
[ 1.593334] Initializing XFRM netlink socket
[ 1.594710] NET: Registered protocol family 10
[ 1.596114] ip6_tables: (C) 2000-2006 Netfilter Core Team
[ 1.596466] sit: IPv6 over IPv4 tunneling driver
[ 1.597464] NET: Registered protocol family 17
[ 1.597526] NET: Registered protocol family 15
[ 1.597679] Bridge firewalling registered
[ 1.598100] Bluetooth: RFCOMM TTY layer initialized
[ 1.598165] Bluetooth: RFCOMM socket layer initialized
[ 1.598184] Bluetooth: RFCOMM ver 1.11
[ 1.598201] Bluetooth: BNEP (Ethernet Emulation) ver 1.3
[ 1.598215] Bluetooth: BNEP filters: protocol multicast
[ 1.598279] Bluetooth: BNEP socket layer initialized
[ 1.598297] Bluetooth: HIDP (Human Interface Emulation) ver 1.2
[ 1.598326] Bluetooth: HIDP socket layer initialized
[ 1.598475] l2tp_core: L2TP core driver, V2.0
[ 1.598552] Key type dns_resolver registered
[ 1.602162] Using IPI No-Shortcut mode
[ 1.602209] info[ 0]: name = power_btn, gpio = -1
[ 1.602227] info[ 1]: name = SW1UI4, gpio = 61
[ 1.604725] registered taskstats version 1
[ 1.610511] intel_mid_ssp_spi_unified 0000:00:07.0: found PCI SSP
controller (ID: 8086h:1194h cfg: 0dh)
[ 1.611248] intel_mid_ssp_spi_unified 0000:00:07.0: register with SPI
framework (bus spi3)
[ 1.611414] intel_mid_ssp_spi_unified 0000:00:07.0: master is unqueued,
this is deprecated
[ 1.614290] intel_mid_ssp_spi_unified 0000:00:07.1: found PCI SSP
```

```
controller (ID: 8086h:1194h cfg: 15h)
[ 1.614846] intel_mid_ssp_spi_unified 0000:00:07.1: register with SPI
framework (bus spi5)
[ 1.615006] intel_mid_ssp_spi_unified 0000:00:07.1: master is unqueued,
this is deprecated
[ 1.624470] intel_mid_ssp_spi_unified 0000:00:07.2: found PCI SSP
controller (ID: 8086h:1194h cfg: 19h)
[ 1.625374] intel_mid_ssp_spi_unified 0000:00:07.2: register with SPI
framework (bus spi6)
[ 1.625551] intel_mid_ssp_spi_unified 0000:00:07.2: master is unqueued,
this is deprecated
[ 1.634738] console [netcon0] enabled
[ 1.634758] netconsole: network logging started
[ 1.635336] input: gpio-keys as /devices/platform/gpio-keys/input/input0
[ 1.636056] rtc_cmos rtc_cmos: setting system clock to 2000-01-01
00:05:55 UTC (946685155)
[ 1.636139] pmic_ccsm rpmsg3: Probed pmic_ccsm rpmsg device
[ 1.636517] pmic_ccsm pmic_ccsm: PMIC-ID: c9
[ 1.636541] pmic_ccsm pmic_ccsm: Error reading battery profile from
battid frmwrk
[ 1.645263] pmic_ccsm pmic_ccsm: Battery Over heat exception
[ 1.652296] pmic_ccsm pmic_ccsm: Battery Zone changed. Current zone is 5
[ 1.656525] APIC ID: 0
[ 1.656545] APIC ID: 2
[ 1.656626] Num p-states 2
[ 1.656644] State [0]: core_frequency[500] transition_latency[100]
control[0x52b]
[ 1.656660] State [1]: core_frequency[500] transition_latency[100]
control[0x52b]
[ 1.656836] Num p-states 2
[ 1.656855] State [0]: core_frequency[500] transition_latency[100]
control[0x52b]
[ 1.656871] State [1]: core_frequency[500] transition_latency[100]
control[0x52b]
[ 1.657288] msic_power_btn rpmsg2: Probed mid_pb rpmsg device
[ 1.657353] msic_power_btn mid_powerbtn: Probed mid powerbutton devivce
[ 1.657706] input: mid_powerbtn as
/devices/platform/mid_powerbtn/input/input1
[ 1.663338] ALSA device list:
[ 1.663358] #0: Loopback 1
[ 1.685937] pmic_ccsm pmic_ccsm: USB ID Detected. Notifying OTG driver
[ 1.725484] EXT4-fs (mmcblk0p8): INFO: recovery required on readonly
filesystem
[ 1.725509] EXT4-fs (mmcblk0p8): write access will be enabled during
recovery
[ 1.835247] EXT4-fs (mmcblk0p8): recovery complete
[ 1.836519] EXT4-fs (mmcblk0p8): mounted filesystem with ordered data
mode. Opts: (null)
[ 1.836603] VFS: Mounted root (ext4 filesystem) readonly on device 179:8.
[ 1.837148] devtmpfs: mounted
[ 1.837583] Freeing unused kernel memory: 624k freed
```

```
[ 1.838265] Write protecting the kernel text: 6584k
[ 1.838838] Write protecting the kernel read-only data: 2612k
[ 1.838852] NX-protecting the kernel data: 5704k
[ 2.051525] systemd[1]: systemd 213 running in system mode. (-PAM -AUDIT
-SELINUX +IMA +SYSVINIT -LIBCRYPTSETUP -GCRYPT +ACL +XZ -SECCOMP -APPARMOR)
```

df

```
root@EdisonArduino:~# df
Filesystem            1K-blocks      Used Available Use% Mounted on
/dev/root              475080    317724    120660   72% /
devtmpfs              491736         0    491736    0% /dev
tmpfs                 492048         0    492048    0% /dev/shm
tmpfs                 492048        564    491484    0% /run
tmpfs                 492048         0    492048    0% /sys/fs/cgroup
tmpfs                 492048        564    491484    0% /etc/machine-id
systemd-1              5638       5184        454   92% /boot
tmpfs                 492048         4    492044    0% /tmp
systemd-1             2337308       3584    2317340    0% /home
tmpfs                 492048         0    492048    0% /var/volatile
/dev/mmcblk0p5          1003         19         913    2% /factory
/dev/mmcblk0p10        2337308       3584    2317340    0% /home
/dev/mmcblk0p7          5638       5184        454   92% /boot
```

Software

bootloader

組み込み系と同じくU-Boot でしたgrub かと思ってました。

```
*****
PSH KERNEL VERSION: b0182727
                    WR: 20104000
*****

SCU IPC: 0x800000d0  0xffffce92c

PSH miaHOB version: TNG.B0.VVBD.0000000c

microkernel built 23:15:13 Apr 24 2014

***** PSH loader *****
PCM page cache size = 192 KB
```

```
Cache Constraint = 0 Pages
Arming IPC driver ..
Adding page store pool ..
PagestoreAddr(IMR Start Address) = 0x04899000
pageStoreSize(IMR Size)           = 0x00080000
```

```
*** Ready to receive application ***
```

```
U-Boot 2014.04 (Oct 14 2014 - 15:19:04)
```

```
        Watchdog enabled
DRAM:   980.6 MiB
MMC:    tangier_sdhci: 0
In:     serial
Out:    serial
Err:    serial
Hit any key to stop autoboot:  0
boot >
```

用意されているコマンドはそれなりに揃っているようです。

```
boot > help
?          - alias for 'help'
askenv    - get environment variables from stdin
base      - print or set address offset
bdfinfo   - print Board Info structure
boot      - boot default, i.e., run 'bootcmd'
bootd     - boot default, i.e., run 'bootcmd'
bootelf   - Boot from an ELF image in memory
bootm     - boot application image from memory
bootvx    - Boot vxWorks from an ELF image
cmp       - memory compare
coninfo   - print console devices and information
cp        - memory copy
crc32     - checksum calculation
dcache    - enable or disable data cache
dfu       - Device Firmware Upgrade
echo      - echo args to console
editenv   - edit environment variable
env       - environment handling commands
exit      - exit script
ext4load  - load binary file from a Ext4 filesystem
ext4ls    - list files in a directory (default /)
ext4write - create a file in the root directory
false     - do nothing, unsuccessfully
fatinfo   - print information about filesystem
fatload   - load binary file from a dos filesystem
fatls     - list files in a directory (default /)
```

```
fatwrite- write file into a dos filesystem
gettime - get timer val elapsed,

go      - start application at address 'addr'
gpt     - GUID Partition Table
grepenv - search environment variables
hash    - compute message digest
help    - print command description/usage
icache  - enable or disable instruction cache
in      - read data from an IO port
ini     - parse an ini file in memory and merge the specified section into
the env
interrupts- enable or disable interrupts
irqinfo - print information about IRQs
itest   - return true/false on integer compare
load    - load binary file from a filesystem
loadb   - load binary file over serial line (kermit mode)
loads   - load S-Record file over serial line
loadx   - load binary file over serial line (xmodem mode)
loady   - load binary file over serial line (ymodem mode)
loop    - infinite loop on address range
ls      - list files in a directory (default /)
md      - memory display
meminfo - display memory information
mm      - memory modify (auto-incrementing address)
mmc     - MMC sub system
mmcinfo - display MMC info
mw      - memory write (fill)
nm      - memory modify (constant address)
out     - write datum to IO port
part    - disk partition related commands
pci     - list and access PCI Configuration Space
printenv- print environment variables
read    - Load binary data from a partition
reginfo - print register information
reset   - Perform RESET of the CPU
run     - run commands in an environment variable
saveenv - save environment variables to persistent storage
setenv  - set environment variables
setexpr - set environment variable as the result of eval expression
shasum  - compute SHA1 message digest
showvar - print local hushshell variables
sleep   - delay execution for some time
source  - run script from memory
test    - minimal test like /bin/sh
timer   - access the system timer
true    - do nothing, successfully
version - print monitor, compiler and linker version
zboot   - Boot bzImage
boot >
```

ただbarebox に慣れた身には U-Boot の原始的な環境は辛いものがあります。

Benchmark

フィボナッチ数列ベンチマーク

フィボナッチ数列でベンチマークのベンチマークを行ってみます。

node.js

fib.js

```
function fib(n) {  
  if (n < 2) return n;  
  return fib(n - 2) + fib(n - 1);  
}  
  
console.log(fib(38));
```

```
root@EdisonArduino:~# time node fib.js  
39088169  
real    0m 10.71s  
user    0m 10.79s  
sys 0m 0.19s  
root@EdisonArduino:~#
```

node.js でのフィボナッチ数列ベンチマークは、ARM Cortex-A8 1GHz のほうが高速でした。

OpenSSL

OpenSSL で、AES-128-CBC の速度計測を行ってみます。

```
root@EdisonArduino:~# openssl speed -evp aes-128-cbc -elapsed  
You have chosen to measure elapsed time instead of user CPU time.  
Doing aes-128-cbc for 3s on 16 size blocks: 8135568 aes-128-cbc's in 3.00s  
Doing aes-128-cbc for 3s on 64 size blocks: 3123516 aes-128-cbc's in 3.00s  
Doing aes-128-cbc for 3s on 256 size blocks: 943748 aes-128-cbc's in 3.00s  
Doing aes-128-cbc for 3s on 1024 size blocks: 248896 aes-128-cbc's in 3.00s  
Doing aes-128-cbc for 3s on 8192 size blocks: 31568 aes-128-cbc's in 3.00s  
OpenSSL 1.0.1g 7 Apr 2014  
built on: Thu Oct 9 11:11:26 CEST 2014
```

```

options:bn(64,32) rc4(8x,mmx) des(ptr,risc1,16,long) aes(partial) idea(int)
blowfish(idx)
compiler: i586-poky-linux-gcc -m32 -march=core2 -mtune=core2 -msse3 -
mfpmath=sse -mstackrealign -fno-omit-fra
me-pointer --sysroot=/data/jenkins_worker/workspace/edison-rel1-
weekly/build/tmp/sysroots/edison -fPIC -DOPENS
SL_PIC -DOPENSSL_THREADS -D_REENTRANT -DDSO_DLFCN -DHAVE_DLFCN_H -DL_ENDIAN
-DTERMI0 -O2 -pipe -g -felimi
nate-unused-debug-types -Wall -Wa,--noexecstack -DHAVE_CRYPTODEV -
DUSE_CRYPTODEV_DIGESTS -DOPENSSL_BN_ASM_PART
_WORDS -DOPENSSL_IA32_SSE2 -DOPENSSL_BN_ASM_MONT -DOPENSSL_BN_ASM_GF2m -
DSHA1_ASM -DSHA256_ASM -DSHA512_ASM -D
MD5_ASM -DRMD160_ASM -DAES_ASM -DVPAES_ASM -DWHIRLPOOL_ASM -DGHASH_ASM
The 'numbers' are in 1000s of bytes per second processed.
type          16 bytes      64 bytes      256 bytes    1024 bytes    8192
bytes
aes-128-cbc      43389.70k      66635.01k      80533.16k      84956.50k
86201.69k

```

AES-NI が効いているっぽい速度がでています。

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