

# Boot linux over NFS

The following text describes on how to use NFS for the root filesystem. For the rest of this text 'client' means the diskless system, and 'server' means the NFS server.

## NFS server settings (HOST PC)

Install nfs packages.

host

```
sudo apt-get install nfs-kernel-server nfs-common
```

After insert your eMMC or SD card, copy the Root File System.

host

```
# The rootfs folder is mounted your RFS by SD card.  
sudo cp -rp /media/$USER/rootfs /home/$USER/rootfs
```

**Note: You can also user rsync to copy all file.**

host

```
mkdir /tmp/rootfs  
mount /dev/sdb2 /tmp/rootfs  
rsync -avzh /tmp/rootfs /home/$USER/rootfs  
sync  
umount /dev/sdb2
```

Add following line in “/etc/exports”

```
/home/$USER/rootfs *(rw,sync,no_root_squash,no_subtree_check)
```

Restart NFS service.

host

```
sudo service nfs-kernel-server restart
```

Modify /home/\$USER/rootfs/etc/network/interfaces

```
# interfaces(5) file used by ifup(8) and ifdown(8)

auto lo
iface lo inet loopback
```

## Kernel configuration on Odroid C2



To use the NFS, you first need to update the kernel version to “3.14.65-74” or higher.

```
sudo apt-get update && sudo apt-get dist-upgrade
```

To use Ethernet and NFS on initramfs you need to change module to built-in.

### kernel configuration

Location:

```
-> File systems
  -> Network File Systems
    <*> NFS client support
    <*> NFS client support for NFS version 3
```

Then, Update your ODRROID's kernel.  
Refer to the following links How to kernel update.

- [ODROID-C2 kernel update](#)

## NFS Client(Target Board) settings

### How to add the boot argument

You should modify boot.ini file or compile to a u-boot script.

Append following line to the boot argument.

```
boot=nfs root=/dev/nfs ip=dhcp nfsroot=${rfspath} rw
```

Modify “/media/boot/boot.ini”. Delete existing **root** argument and add **boot=nfs root=/dev/nfs ip=dhcp nfsroot=\${rfspath} rw** at the head of the line like below.

```
setenv rfspath 192.168.0.22:/home/john/rootfs
setenv bootargs "boot=nfs root=/dev/nfs ip=dhcp nfsroot=${rfspath} rw"
```

```
rootwait ro ${condev} no_console_suspend hdmimode=${m} ${cmode}
m_bpp=${m_bpp} vout=${vout} fsck.repair=yes net.ifnames=0 elevator=noop
disablehpd=${hpd} max_freq=${max_freq} maxcpus=${maxcpus}
monitor_onoff=${monitor_onoff} disableuhs=${disableuhs}
mmc_removable=${mmc_removable} usbmulticam=${usbmulticam} ${hid_quirks}"
```

In order to mount the filesystem via NFS in RW mode we need to update the /etc/fstab of the.

**Note: update the NFS/etc/fstab.**

```
192.168.30.27:/home/john/nfs/c2/rootfs / nfs defaults 0 0
```

Reboot.

target

```
sudo reboot
```

Nice to have a lot of disk space:

target

```
odroid@odroid64:~$ df -h
Filesystem                Size      Used Avail Use% Mounted
on
udev                      734M         0   734M   0% /dev
tmpfs                     172M    5.0M   167M   3% /run
192.168.30.27:/home/john/nfs/c2/rootfs 392G    57G   315G  16% /
tmpfs                     860M    100K   860M   1% /dev/shm
tmpfs                     5.0M     4.0K   5.0M   1% /run/lock
tmpfs                     860M         0   860M   0%
/sys/fs/cgroup
/dev/mmcblk0p1            128M     20M   108M  16%
/media/boot
cgmfs                     100K         0   100K   0%
/run/cgmanager/fs
tmpfs                     172M     20K   172M   1%
/run/user/118
tmpfs                     172M         0   172M   0%
/run/user/1000
```

Dmesg output:

target

```
odroid@odroid64:~$ dmesg
[ 0.000000] Initializing cgroup subsys cpuset
[ 0.000000] Initializing cgroup subsys cpu
```

```
[ 0.000000] Initializing cgroup subsys cpuacct
[ 0.000000] Linux version 3.14.29+ (john@pc) (gcc version 4.8.4
(Ubuntu/Linaro 4.8.4-2ubuntu1~14.04.1) ) #1 SMP PREEMPT Mon May 30
13:04:40 KST 2016
[ 0.000000] CPU: AArch64 Processor [410fd034] revision 4
[ 0.000000] secmon: share mem setup
[ 0.000000] Reserved memory: initialized node linux,secmon,
compatible id aml_secmon_memory
[ 0.000000] __reserved_mem_alloc_size: linux,meson-fb
[ 0.000000] fb: Reserved memory: created fb at 0x0000000078000000,
size 128 MiB
[ 0.000000] Reserved memory: initialized node linux,meson-fb,
compatible id amlogic, fb-memory
[ 0.000000] __reserved_mem_alloc_size: linux,di
[ 0.000000] DI reserved memory: created CMA memory pool at
0x0000000076200000, size 30 MiB
[ 0.000000] Reserved memory: initialized node linux,di, compatible
id amlogic, di-mem
[ 0.000000] __reserved_mem_alloc_size: linux,ion-dev
[ 0.000000] linux,ion-dev add multi user:ffffffc001c3ac48
[ 0.000000] ion_dev mem setup
[ 0.000000] Reserved memory: initialized node linux,ion-dev,
compatible id amlogic, idev-mem
[ 0.000000] ppmgr share mem setup
[ 0.000000] linux,ion-dev add multi user:ffffffc001c43508
[ 0.000000] Reserved memory: initialized node linux,ion-dev,
compatible id amlogic, idev-mem
[ 0.000000] __reserved_mem_alloc_size: linux,codec_mm_cma
[ 0.000000] Reserved memory: created CMA memory pool at
0x0000000067800000, size 188 MiB
[ 0.000000] Reserved memory: initialized node linux,codec_mm_cma,
compatible id shared-dma-pool
[ 0.000000] __reserved_mem_alloc_size: linux,picdec
[ 0.000000] Reserved memory: created CMA memory pool at
0x0000000064800000, size 48 MiB
[ 0.000000] Reserved memory: initialized node linux,picdec,
compatible id shared-dma-pool
[ 0.000000] __reserved_mem_alloc_size: linux,codec_mm_reserved
[ 0.000000] codec_mm:vdec: reserved mem setup
[ 0.000000] Reserved memory: initialized node
linux,codec_mm_reserved, compatible id amlogic, codec-mm-reserved
[ 0.000000] cma: Reserved 8 MiB at 5fc00000
[ 0.000000] On node 0 totalpages: 486912
[ 0.000000] Normal zone: 8568 pages used for memmap
[ 0.000000] Normal zone: 0 pages reserved
[ 0.000000] Normal zone: 486912 pages, LIFO batch:31
[ 0.000000] psci: probing function IDs from device-tree
[ 0.000000] PERCPU: Embedded 12 pages/cpu @ffffffc0741a9000 s19456
r8192 d21504 u49152
[ 0.000000] pcpu-alloc: s19456 r8192 d21504 u49152 alloc=12*4096
```

```
[ 0.000000] pcpu-alloc: [0] 0 [0] 1 [0] 2 [0] 3
[ 0.000000] Built 1 zonelists in Zone order, mobility grouping on.
Total pages: 478344
[ 0.000000] Kernel command line: boot=nfs root=/dev/nfs ip=dhcp
nfsroot=192.168.30.27:/home/john/nfs/c2/rootfs rw rootwait rw
console=ttyS0,115200n8 console=tty0 no_console_suspend
hdmimode=1080p60hz m_bpp=32 vout= fsck.fix=yes net.ifnames=0
[ 0.000000] logo: get hdmimode: 1080p60hz
[ 0.000000] PID hash table entries: 4096 (order: 3, 32768 bytes)
[ 0.000000] Dentry cache hash table entries: 262144 (order: 9,
2097152 bytes)
[ 0.000000] Inode-cache hash table entries: 131072 (order: 8,
1048576 bytes)
[ 0.000000] Memory: 1501820K/1947648K available (7746K kernel code,
884K rwdatas, 2704K rodata, 891K init, 3162K bss, 445828K reserved)
[ 0.000000] Virtual kernel memory layout:
          vmalloc : 0xfffff80000000000 - 0xfffff80400000000
( 1024 MB)
          vmemmap : 0xfffff80400100000 - 0xfffff80421d00000
( 33 MB)
          modules : 0xfffff8bffc000000 - 0xfffff8c000000000
( 64 MB)
          memory  : 0xfffff8c000000000 - 0xfffff8c078000000
( 1920 MB)
              .init : 0xfffff8c001ab6000 - 0xfffff8c001b94c00
( 891 kB)
              .text : 0xfffff8c001080000 - 0xfffff8c001ab5ac4
( 10455 kB)
              .data : 0xfffff8c001b95000 - 0xfffff8c001c72050
( 885 kB)
[ 0.000000] SLUB: Hwalign=64, Order=0-1, MinObjects=0, CPUs=4,
Nodes=1
[ 0.000000] Preemptible hierarchical RCU implementation.
[ 0.000000] NR_IRQS:64 nr_irqs:64 0
[ 0.000006] sched_clock: 32 bits at 1000kHz, resolution 1000ns,
wraps every 2147483648000ns
[ 0.000023] mclk->mux_reg =ffffff8000002990,mclk->reg
=ffffff800000a994
[ 0.000069] local timer MESON TIMER-G mclk->mux_reg
=ffffff8000002990,mclk->reg =ffffff800000c998
[ 0.000090] local timer MESON TIMER-H mclk->mux_reg
=ffffff8000002990,mclk->reg =ffffff800000e99c
[ 0.000110] local timer MESON TIMER-I mclk->mux_reg
=ffffff8000002990,mclk->reg =ffffff80000109a0
[ 0.000122] Switching to timer-based delay loop
[ 0.000335] Console: colour dummy device 80x25
[ 0.000833] console [tty0] enabled
[ 0.003185] allocated 8388608 bytes of page_cgroup
[ 0.003195] please try 'cgroup_disable=memory' option if you don't
want memory cgroups
[ 0.003215] Calibrating delay loop (skipped), value calculated using
```

```
timer frequency.. 2.00 BogoMIPS (lpj=10000)
[ 0.003233] pid_max: default: 32768 minimum: 301
[ 0.003329] Security Framework initialized
[ 0.003357] AppArmor: AppArmor initialized
[ 0.003400] Mount-cache hash table entries: 4096 (order: 3, 32768
bytes)
[ 0.003413] Mountpoint-cache hash table entries: 4096 (order: 3,
32768 bytes)
[ 0.005274] device-tree: Duplicate name in /efusekey, renamed to
"key0#1"
[ 0.005290] device-tree: Duplicate name in /efusekey, renamed to
"key1#1"
[ 0.005304] device-tree: Duplicate name in /efusekey, renamed to
"key2#1"
[ 0.005318] device-tree: Duplicate name in /efusekey, renamed to
"key3#1"
[ 0.007005] Initializing cgroup subsys debug
[ 0.007018] Initializing cgroup subsys memory
[ 0.007037] Initializing cgroup subsys devices
[ 0.007047] Initializing cgroup subsys freezer
[ 0.007058] Initializing cgroup subsys net_cls
[ 0.007067] Initializing cgroup subsys blkio
[ 0.007076] Initializing cgroup subsys perf_event
[ 0.007090] Initializing cgroup subsys net_prio
[ 0.007100] Initializing cgroup subsys hugetlb
[ 0.007131] ftrace: allocating 28242 entries in 111 pages
[ 0.032467] /cpus/cpu@0: Missing clock-frequency property
[ 0.032497] /cpus/cpu@1: Missing clock-frequency property
[ 0.032509] /cpus/cpu@2: Missing clock-frequency property
[ 0.032521] /cpus/cpu@3: Missing clock-frequency property
[ 0.032535] hw perfevents: enabled with arm/armv8-pmuv3 PMU driver,
7 counters available
[ 0.071841] Meson chip version = RevB (1F:B - 0:0)
[ 0.090801] CPU1: Booted secondary processor
[ 0.110788] CPU2: Booted secondary processor
[ 0.130779] CPU3: Booted secondary processor
[ 0.130833] Brought up 4 CPUs
[ 0.130863] SMP: Total of 4 processors activated.
[ 0.131395] devtmpfs: initialized
[ 0.143148] pinctrl core: initialized pinctrl subsystem
[ 0.143424] regulator-dummy: no parameters
[ 0.143741] NET: Registered protocol family 16
[ 0.144404] register canvas platform driver
[ 0.144415] codec:ignore bus ops for cpu=25
[ 0.144423] codec:ignore bus ops for cpu=29
[ 0.144431] codec:register amports ops for bus[0]
[ 0.144439] codec:register amports ops for bus[4]
[ 0.144447] codec:register amports ops for bus[3]
[ 0.144454] codec:register amports ops for bus[2]
[ 0.144461] codec:register amports ops for bus[1]
```

```
[ 0.144469] codec:register amports ops for bus[13]
[ 0.144477] codec:register amports ops for bus[2]
[ 0.144484] codec:register amports ops for bus[14]
[ 0.144506] register rdma platform driver
[ 0.144859] vdso: 2 pages (1 code, 1 data) at base fffffffc001b9e000
[ 0.144891] hw-breakpoint: found 6 breakpoint and 4 watchpoint
registers.
[ 0.145411] DMA: preallocated 256 KiB pool for atomic allocations
[ 0.146610] software IO TLB [mem 0x5c400000-0x5c800000] (4MB) mapped
at [ffffffc05c400000-ffffffc05c7fffff]
[ 0.146624] Serial: AMBA PL011 UART driver
[ 0.146703] hdmitx: system: amhdmitx_init
[ 0.146711] hdmitx: system: Ver: 2014May6
[ 0.146740] tv_vout: tv_init_module
[ 0.146754] tv_vout: major number 254 for disp
[ 0.146762] vout_notify: vout_register_server
[ 0.146770] tv_vout: register tv module server ok
[ 0.146796] codec_mm:codec_mm_module_init
[ 0.146911] gxbb clk HIU base is 0xffffffff800005a000
[ 0.146920] gxbb clk ao base is 0xffffffff800005c000
[ 0.146958] register mpll_clk_out0 success done
[ 0.146971] register mpll_clk_out1 success done
[ 0.146981] register mpll_clk_out2 success done
[ 0.147150] register sys pll success done
[ 0.147194] clkrate [ xtal ] : 24000000Hz
[ 0.147203] clkrate [ 32Khz ] : 32000Hz
[ 0.147212] clkrate [ clk81 ] : 166666666Hz
[ 0.147220] clkrate [ fixed_pll ] : 2000000000Hz
[ 0.147228] clkrate [ fclk_div2 ] : 1000000000Hz
[ 0.147236] clkrate [ fclk_div3 ] : 666666000Hz
[ 0.147244] clkrate [ fclk_div4 ] : 500000000Hz
[ 0.147252] clkrate [ fclk_div5 ] : 400000000Hz
[ 0.147260] clkrate [ fclk_div7 ] : 285714000Hz
[ 0.147287] gxbb clock initialization complete
[ 0.147388]
msr_clk_reg0=ffffff800005e75c,msr_clk_reg2=ffffff800006a764
[ 0.148198] amlogic iomap probe done
[ 0.148341] Init pinux probe!
[ 0.149051] pinmux-gxbb c1109880.pinmux: Probed amlogic pinctrl
driver
[ 0.149298] genirq: Setting trigger mode 8 for irq 241 failed
(gic_set_type+0x0/0xbc)
[ 0.149319] genirq: Setting trigger mode 8 for irq 242 failed
(gic_set_type+0x0/0xbc)
[ 0.149382] genirq: Setting trigger mode 8 for irq 241 failed
(gic_set_type+0x0/0xbc)
[ 0.149401] genirq: Setting trigger mode 8 for irq 242 failed
(gic_set_type+0x0/0xbc)
[ 0.149993] codec:codec map io source
0x00000000c1100000,size=1048576 to 0xffffffff8000680000
[ 0.150013] codec:codec map io source 0x00000000c8820000,size=65536
```



```
to 0xffffffff80000a0000
[ 0.150031] codec:codec map io source 0x00000000c883c000,size=8192
to 0xffffffff8000094000
[ 0.150110] codec:codec map io source
0x00000000c8100000,size=1048576 to 0xffffffff8000800000
[ 0.150131] codec:codec map io source 0x00000000d0100000,size=262144
to 0xffffffff8000980000
[ 0.150150] codec:codec map io source 0x00000000c8838000,size=1024
to 0xffffffff8000092000
[ 0.150211] codec_mm has 2 memory regions
[ 0.150226] codec_mm codec_mm.14: assigned reserved memory node
linux,codec_mm_cma ok
[ 0.150241] codec_mm:codec_mm_reserved_init
0000000060700000->0000000064800000
[ 0.150254] codec_mm codec_mm.14: assigned reserved memory node
linux,codec_mm_reserved ok
[ 0.150266] codec_mm:codec_mm_probe mem init done
[ 0.150276] codec_mm:add reserve memory 0000000060700000(aligned
0000000060700000) size=4100000(aligned 4100000)
[ 0.150302] codec_mm has 2 memory regions
[ 0.150313] codec_mm codec_mm.14: assigned reserved memory node
linux,codec_mm_cma ok
[ 0.150326] codec_mm:codec_mm_reserved_init
0000000060700000->0000000064800000
[ 0.150338] codec_mm codec_mm.14: assigned reserved memory node
linux,codec_mm_reserved ok
[ 0.150350] codec_mm:codec_mm reserved memory probed done
[ 0.150357] codec_mm:codec_mm_probe ok
[ 0.150924] VPU driver version: v01
[ 0.150933] vpu driver detect cpu type: gxbaby
[ 0.150949] load vpu_clk in dts: 666667000Hz(7)
[ 0.150972] vpu_probe OK
[ 0.151158] hdmitx: system: amhdmitx_probe
[ 0.151359] hdmitx hpd irq = 89
[ 0.151550] hdmitx20: Mapped PHY: 0xc0800000
[ 0.151560] hdmitx20: Mapped PHY: 0xc1104400
[ 0.151582] hdmitx20: Mapped PHY: 0xc8100000
[ 0.151591] hdmitx20: Mapped PHY: 0xc8834000
[ 0.151600] hdmitx20: Mapped PHY: 0xc883a000
[ 0.151609] hdmitx20: Mapped PHY: 0xc883c000
[ 0.151622] hdmitx20: Mapped PHY: 0xd0100000
[ 0.151631] hdmitx20: Mapped PHY: 0xda83a000
[ 0.151870] avmute set to 1
[ 0.152136] canvas_probe reg=00000000c8838000,size=400
[ 0.152152] canvas maped reg_base =ffffff800009e000
[ 0.155406] rdma_probe
[ 0.185787] bio: create slab <bio-0> at 0
[ 0.186259] SCSI subsystem initialized
[ 0.186410] usbcore: registered new interface driver usbfs
[ 0.186447] usbcore: registered new interface driver hub
```



```
[ 0.186498] usbcore: registered new device driver usb
[ 0.186563] media: Linux media interface: v0.10
[ 0.186593] Linux video capture interface: v2.00
[ 0.186639] pps_core: LinuxPPS API ver. 1 registered
[ 0.186648] pps_core: Software ver. 5.3.6 - Copyright 2005-2007
Rodolfo Giometti <giometti@linux.it>
[ 0.186668] PTP clock support registered
[ 0.186818] logo: logo_init
[ 0.186854] Advanced Linux Sound Architecture Driver Initialized.
[ 0.187152] Bluetooth: Core ver 2.18
[ 0.187175] NET: Registered protocol family 31
[ 0.187184] Bluetooth: HCI device and connection manager initialized
[ 0.187198] Bluetooth: HCI socket layer initialized
[ 0.187210] Bluetooth: L2CAP socket layer initialized
[ 0.187231] Bluetooth: SCO socket layer initialized
[ 0.187244] NetLabel: Initializing
[ 0.187251] NetLabel: domain hash size = 128
[ 0.187258] NetLabel: protocols = UNLABELED CIPSOv4
[ 0.187297] NetLabel: unlabeled traffic allowed by default
[ 0.187814] Switched to clocksource Timer-E
[ 0.209711] AppArmor: AppArmor Filesystem Enabled
[ 0.214012] NET: Registered protocol family 2
[ 0.214509] TCP established hash table entries: 16384 (order: 5,
131072 bytes)
[ 0.214628] TCP bind hash table entries: 16384 (order: 6, 262144
bytes)
[ 0.214839] TCP: Hash tables configured (established 16384 bind
16384)
[ 0.214910] TCP: reno registered
[ 0.214922] UDP hash table entries: 1024 (order: 3, 32768 bytes)
[ 0.214964] UDP-Lite hash table entries: 1024 (order: 3, 32768
bytes)
[ 0.215138] NET: Registered protocol family 1
[ 0.215339] RPC: Registered named UNIX socket transport module.
[ 0.215350] RPC: Registered udp transport module.
[ 0.215358] RPC: Registered tcp transport module.
[ 0.215365] RPC: Registered tcp NFSv4.1 backchannel transport
module.
[ 0.215527] Unpacking initramfs...
[ 0.477667] Freeing initrd memory: 8108K (ffffffc073749000 -
ffffffc073f34000)
[ 0.478466] kvm [1]: Using HYP init bounce page @5b02a000
[ 0.478650] kvm [1]: error: no compatible GIC node found
[ 0.478681] kvm [1]: error initializing Hyp mode: -19
[ 0.479085] futex hash table entries: 1024 (order: 5, 131072 bytes)
[ 0.479167] audit: initializing netlink subsys (disabled)
[ 0.479210] audit: type=2000 audit(0.460:1): initialized
[ 0.479639] HugeTLB registered 2 MB page size, pre-allocated 0 pages
[ 0.483321] VFS: Disk quotas dquot_6.5.2
[ 0.483474] Dquot-cache hash table entries: 512 (order 0, 4096
bytes)
```

```
[ 0.485117] msgmni has been set to 3437
[ 0.485936] Block layer SCSI generic (bsg) driver version 0.4 loaded
(major 248)
[ 0.486006] io scheduler noop registered (default)
[ 0.486016] io scheduler deadline registered
[ 0.486105] io scheduler cfq registered
[ 0.507429] meson-rng c8834000.rng: hwrng registered
[ 0.507560] mali-utgard d00c0000.mali: max pp is 3
[ 0.507572] mali-utgard d00c0000.mali: set min pp to default 1
[ 0.507583] mali-utgard d00c0000.mali: min pp is 1
[ 0.507593] mali-utgard d00c0000.mali: set min clk default to 0
[ 0.507603] mali-utgard d00c0000.mali: min clk is 0
[ 0.507618] mali-utgard d00c0000.mali: hiu io source
0xffffffff80000d2000
[ 0.507634] mali-utgard d00c0000.mali: hiu io source
0xffffffff80000e4000
[ 0.507645] mali-utgard d00c0000.mali: num of pp used most of time 3
[ 0.507656] mali-utgard d00c0000.mali: clock dvfs table size is 6
[ 0.507667] mali-utgard d00c0000.mali: max clk set 4
[ 0.507676] mali-utgard d00c0000.mali: max clk is 4
[ 0.507686] mali-utgard d00c0000.mali: turbo clk set to 5
[ 0.507695] mali-utgard d00c0000.mali: turbo clk is 5
[ 0.507705] mali-utgard d00c0000.mali: default clk set to 2
[ 0.507715] mali-utgard d00c0000.mali: default clk is 2
[ 0.507772] mali-utgard d00c0000.mali:
=====0=====
                clk_freq= 125000000, clk_parent=fclk_div4, voltage=1150,
keep_count=5, threshod=<30 120>, clk_sample=125
[ 0.507798] mali-utgard d00c0000.mali:
=====1=====
                clk_freq= 285000000, clk_parent=fclk_div7, voltage=1150,
keep_count=5, threshod=<100 190>, clk_sample=285
[ 0.507844] mali-utgard d00c0000.mali:
=====2=====
                clk_freq= 400000000, clk_parent=fclk_div5, voltage=1150,
keep_count=5, threshod=<152 207>, clk_sample=400
[ 0.507870] mali-utgard d00c0000.mali:
=====3=====
                clk_freq= 500000000, clk_parent=fclk_div4, voltage=1150,
keep_count=5, threshod=<180 220>, clk_sample=500
[ 0.507895] mali-utgard d00c0000.mali:
=====4=====
                clk_freq= 666000000, clk_parent=fclk_div3, voltage=1150,
keep_count=5, threshod=<210 236>, clk_sample=666
[ 0.507920] mali-utgard d00c0000.mali:
=====5=====
                clk_freq= 792000000, clk_parent= gp0_pll, voltage=1150,
keep_count=5, threshod=<230 255>, clk_sample=792
[ 0.509396] gpu cooling register okay with err=0
[ 0.509441] gpu core cooling register okay with err=0
```

```
[ 0.509583] Mali: Mali device driver loaded
[ 0.511688] loop: module loaded
[ 0.512013] mtdoops: mtd device (mtddev=name/number) must be
supplied
[ 0.520751] libphy: stmmac: probed
[ 0.520775] eth0: PHY ID 001cc916 at 0 IRQ POLL (stmmac-0:00) active
[ 0.520786] eth0: PHY ID 001cc916 at 7 IRQ POLL (stmmac-0:07)
[ 0.521058] usbcore: registered new interface driver cdc_ether
[ 0.521115] usbcore: registered new interface driver cdc_ncm
[ 0.521209] ehci_hcd: USB 2.0 'Enhanced' Host Controller (EHCI)
Driver
[ 0.521220] ehci-h20ahb: H20AHB-EHCI Host Controller driver
[ 0.521300] ohci_hcd: USB 1.1 'Open' Host Controller (OHCI) Driver
[ 0.521359] usbcore: registered new interface driver cdc_acm
[ 0.521368] cdc_acm: USB Abstract Control Model driver for USB
modems and ISDN adapters
[ 0.521412] usbcore: registered new interface driver usb-storage
[ 0.521497] usbcore: registered new interface driver usbserial
[ 0.521709] mousedev: PS/2 mouse device common for all mice
[ 0.521928] i2c /dev entries driver
[ 0.522000] IR NEC protocol handler initialized
[ 0.522009] IR RC5(x) protocol handler initialized
[ 0.522017] IR RC6 protocol handler initialized
[ 0.522024] IR JVC protocol handler initialized
[ 0.522032] IR Sony protocol handler initialized
[ 0.522040] IR RC5 (streamzap) protocol handler initialized
[ 0.522048] IR SANYO protocol handler initialized
[ 0.522056] IR MCE Keyboard/mouse protocol handler initialized
[ 0.522493] ledtrig-cpu: registered to indicate activity on CPUs
[ 0.522645] usbcore: registered new interface driver usbhid
[ 0.522654] usbhid: USB HID core driver
[ 0.522842] ashmem: initialized
[ 0.522942] logger: created 256K log 'log_main'
[ 0.523036] logger: created 256K log 'log_events'
[ 0.523123] logger: created 256K log 'log_radio'
[ 0.523210] logger: created 256K log 'log_system'
[ 0.523453] ==uart0 reg addr = fffffff80002724c0
[ 0.523480] c81004c0.serial: ttyS0 at MMIO 0xc81004c0 (irq = 225,
base_baud = 1500000) is a meson_uart
[ 0.523501] ttyS0 use xtal 24000000 change 0 to 115200
[ 2.191428] console [ttyS0] enabled
[ 2.195030] ==uart1 reg addr = fffffff80002744c0
[ 2.199375] c11084c0.serial: ttyS1 at MMIO 0xc11084c0 (irq = 58,
base_baud = 1500000) is a meson_uart
[ 2.208685] enter cpufreq
[ 2.211178] probe cpufreq okay
[ 2.216552] dwc_otg c9100000.dwc2_b:
dwc_otg_driver_probe(ffffffc05d728200)
[ 2.256596] dwc_otg: usb1: type: 1 speed: 0, config: 0, dma: 0, id:
1, phy: c0000020, ctrl: 0
[ 2.259467] dwc_otg c9100000.dwc2_b: base=0xffffffff8001680000
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[ 2.259474] dwc_otg c9100000.dwc2_b:
dwc_otg_device=0xffffffc05a99ef00
[ 2.262135] dwc_otg: Core Release: 3.10a
[ 2.263337] dwc_otg: Setting default values for core params
[ 2.268872] dwc_otg: curmode: 1, host_only: 1
[ 2.273176] dwc_otg c9100000.dwc2_b: DMA config: BURST_DEFAULT
[ 2.275360] dwc_otg: Using Buffer DMA mode
[ 2.277220] dwc_otg: OTG VER PARAM: 1, OTG VER FLAG: 1
[ 2.282316] dwc_otg: Working on port type = HOST
[ 2.287102] dwc_otg dwc2_b: DWC OTG Controller
[ 2.291296] dwc_otg dwc2_b: new USB bus registered, assigned bus
number 1
[ 2.298028] dwc_otg dwc2_b: irq 63, io mem 0x00000000
[ 2.303008] dwc_otg: -----hcd->flags.d32 = 0
[ 2.307424] dwc_otg: Init: Port Power? op_state=1
[ 2.312071] dwc_otg: Init1: Power Port (0)
[ 2.316558] hub 1-0:1.0: USB hub found
[ 2.319861] hub 1-0:1.0: 1 port detected
[ 2.323841] dwc_otg c9000000.dwc2_a:
dwc_otg_driver_probe(ffffffc05d728600)
[ 2.323876] dwc_otg: usb0: type: 0 speed: 0, config: 0, dma: 0, id:
0, phy: c0000000, ctrl: 0
[ 2.332170] dwc_otg c9000000.dwc2_a: base=0xfffff8001700000
[ 2.332175] dwc_otg c9000000.dwc2_a:
dwc_otg_device=0xffffffc073962f00
[ 2.344750] dwc_otg: Core Release: 3.10a
[ 2.344772] dwc_otg: Setting default values for core params
[ 2.348573] dwc_otg: curmode: 1, host_only: 0
[ 2.354884] dwc_otg c9000000.dwc2_a: DMA config: BURST_DEFAULT
[ 2.357056] dwc_otg: Using Buffer DMA mode
[ 2.357078] dwc_otg: OTG VER PARAM: 1, OTG VER FLAG: 1
[ 2.362020] dwc_otg: Working on port type = OTG
[ 2.366496] dwc_otg: Current port type: SLAVE
[ 2.370898] dwc_otg dwc2_a: DWC OTG Controller
[ 2.375217] dwc_otg dwc2_a: new USB bus registered, assigned bus
number 2
[ 2.381955] dwc_otg dwc2_a: irq 62, io mem 0x00000000
[ 2.387285] hub 2-0:1.0: USB hub found
[ 2.390675] hub 2-0:1.0: 1 port detected
[ 2.394633] dwc_otg: Dedicated Tx FIFOs mode
[ 2.398930] dwc_otg: using timer detectid change, ffffffc07399c000
[ 2.405183] secmon has 1 memory regions
[ 2.408705] secmon: share in base: 0xfffff80004e6000, share out
base: 0xfffff80004e8000
[ 2.416782] secmon secmon.3: assigned reserved memory node
linux,secmon ok
[ 2.423645] secmon: probe done
[ 2.426710] storage: storage in base: 0xfffff8001780000
[ 2.431882] storage: storage out base: 0xfffff8001800000
[ 2.437221] storage: storage block base: 0xfffff8001880000
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[ 2.442747] storage: probe done!
[ 2.445977] Error: Driver 'ICPlus IP175C' is already registered,
aborting...
[ 2.452926] libphy: ICPlus IP175C: Error -16 in registering driver
[ 2.459514] aml_sd_emmc_probe: line 2954
[ 2.462924] mmc driver version: 1.07, 2015-01-21: fix a bug in
tuning which caused eMMC data CRC error
[ 2.472324] aml_sd_emmc_reg_init 677
[ 2.475752] pdata->caps 60007
[ 2.478631] pdata->caps2 0
[ 2.481296] get property:                ocr_avail, value:0x00200080
[ 2.487591] get property:                f_min, value:0x00061a80
[ 2.493932] get property:                f_max, value:0x0510ff40
[ 2.500192] get property:                max_req_size, value:0x00020000
[ 2.506480] get property:                irq_in, value:0x00000003
[ 2.512786] get property:                irq_out, value:0x00000005
[ 2.519116] dwc_otg: Indeed it is in host mode hprt0 = 00021501
[ 2.527835] get property:                power_level, value:0x00000001
[ 2.531243] get property:                gpio_cd, str:
[ 2.536498] get property:                gpio_power, str:
[ 2.541765] get property:                pinname, str:sd
[ 2.547191] get property:                jtag_pin, str:
[ 2.552458] get property:                card_type, value:0x00000005
[ 2.558755] get property:                gpio_dat3, str:
[ 2.564011] get property:                gpio_volsw, str:
[ 2.637912] [aml_sd_emmc_probe] aml_sd_emmc_probe() success!
[ 2.637974] aml_sd_emmc_probe: line 2954
[ 2.648912] [aml_is_card_insert][0;40;33m card OUT
[0m
[ 2.657902] [aml_is_card_insert][0;40;33m card OUT
[0m
[ 2.679125] aml_sd_emmc_reg_init 677
[ 2.679241] pdata->caps 80000d47
[ 2.680265] pdata->caps2 80a1
[ 2.683190] get property:                ocr_avail, value:0x00200080
[ 2.689514] get property:                f_min, value:0x00061a80
[ 2.695782] get property:                f_max, value:0x05f5e100
[ 2.697845] usb 1-1: new high-speed USB device number 2 using
dwc_otg
[ 2.698111] dwc_otg: Indeed it is in host mode hprt0 = 00001101
[ 2.714335] get property:                max_req_size, value:0x00020000
[ 2.720633] get property:                pinname, str:emmc
[ 2.726229] get property:                card_type, value:0x00000001
[ 2.732536] get property:                gpio_dat3, str:
[ 2.737787] get property:                hw_reset, str:
[ 2.797830] aml_emmc_hw_reset 1356
[ 2.797832] [aml_sd_emmc_probe] aml_sd_emmc_probe() success!
[ 2.798027] ion_dev has 1 memory regions
[ 2.817613] fb: osd_init_module
[ 2.817706] fb: viu vsync irq: 35
[ 2.818422] meson-fb has 1 memory regions
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[ 2.823515] meson-fb meson-fb.11: assigned reserved memory node
linux,meson-fb ok
[ 2.829807] tv_vout: tv_set_current_vmode[672]fps_target_mode=10
[ 2.835740] tv_vout: mode is
10, sync_duration_den=1, sync_duration_num=60
[ 2.842392] switch_vpu_mem_pd: vencp ON
[ 2.846177] tv_vout: TV mode 720p60hz selected.
[ 2.850679] tv_vout: new mode =720p60hz set ok
[ 2.855059] vout_serive: vinfo mode is: 720p60hz
[ 2.859632] switch_vpu_mem_pd: viuosd1 ON
[ 2.863598] switch_vpu_mem_pd: viuosd2 ON
[ 2.867652] switch_vpu_mem_pd: viuosd_scale ON
[ 2.871595] emmc: BKOPS_EN bit is not set
[ 2.876301] [aml_sd_voltage_switch] [0;40;32m switch to 1.8V for a
non-uhs device.
[0m
[ 2.876302] osd_rdma: osd_rdma_init: rmda_table
p=0x5fc49000, op=0x5fc49000 , v=0xffffffff80004fa000
[ 2.887751] emmc: clk 100000000 SDR mode tuning start
[ 2.887982] rx_tuning_result[0][0] = 10
[ 2.888197] rx_tuning_result[0][1] = 10
[ 2.888411] rx_tuning_result[0][2] = 10
[ 2.888625] rx_tuning_result[0][3] = 10
[ 2.888838] rx_tuning_result[0][4] = 10
[ 2.889052] rx_tuning_result[0][5] = 10
[ 2.889267] rx_tuning_result[0][6] = 10
[ 2.889479] rx_tuning_result[0][7] = 10
[ 2.889692] rx_tuning_result[0][8] = 10
[ 2.889905] rx_tuning_result[0][9] = 10
[ 2.889908] best_win_start =0, best_win_size =10
[ 2.889911] sd_emmc_regs->gclock =0x100024a, sd_emmc_regs->gadjust
=0x2000
[ 2.889914] emmc: gclock =0x100024a, gdelay=0x76965077
[ 2.889916] gadjust=0x2000
[ 2.890033] emmc: try set sd/emmc to DDR mode
[ 2.890037] emmc: try set sd/emmc to DDR mode
[ 2.890041] emmc: clk 100000000 DDR mode tuning start
[ 2.890871] rx_tuning_result[0][0] = 10
[ 2.891608] rx_tuning_result[0][1] = 10
[ 2.892347] rx_tuning_result[0][2] = 10
[ 2.893083] rx_tuning_result[0][3] = 10
[ 2.893170] best_win_start =0, best_win_size =4
[ 2.893173] sd_emmc_regs->gclock =0x1000245, sd_emmc_regs->gadjust
=0x12000
[ 2.893175] emmc: gclock =0x1000245, gdelay=0x76965077
[ 2.893176] gadjust=0x12000
[ 2.893548] emmc: new HS400 MMC card at address 0001
[ 2.893947] emmc: clock 100000000, 8-bit-bus-width

[ 2.893947] mmcblk0: emmc:0001 064GE2 58.2 GiB
```



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[ 3.020095] fb: osd_probe vinfo:fffffc001c3beb8
[ 3.020755] hub 1-1:1.0: USB hub found
[ 3.021013] mmcblk0: p1 p2
[ 3.021380] hub 1-1:1.0: 4 ports detected
[ 3.035095] fb: Frame buffer memory assigned at
[ 3.039386] fb:      phy: 0x78000000, vir:0xffffffff8003c00000,
size=98304K
[ 3.046194] fb: osd_set_res_bootargs : mode 60
[ 3.050607] fb: osd_set_res_bootargs, no available resolution info.
[ 3.056627] fb: fb def : 1280 720 1280 1440 32
[ 3.061206] fb: init fbdev bpp is:32
[ 3.064733] fb: -----clear fb0 memory
[ 3.096564] fb: osd[0] canvas.idx =0x40
[ 3.096566] fb: osd[0] canvas.addr=0x78000000
[ 3.096567] fb: osd[0] canvas.width=5120
[ 3.096569] fb: osd[0] canvas.height=1440
[ 3.122355] Console: switching to colour frame buffer device 160x45
[ 3.153130] fb: Frame buffer memory assigned at
[ 3.153217] fb:      phy: 0x7e000000, vir:0xffffffff8001a00000,
size=1024K
[ 3.173131] fb: osd probe OK
[ 3.173288] vout_serve: vout_init_module
[ 3.174370] vout_serve: meson_vout_probe
[ 3.178215] vout_serve: create vout attribute OK
[ 3.182802] ge2d: ge2d_init_module
[ 3.186125] ge2d: ge2d_dev major:245
[ 3.189789] ge2d: ge2d clock is 400 MHZ
[ 3.193466] ge2d: ge2d: pdev=fffffc05d6de400, irq=182,
rstc=0xffffffffc07398e080, clk=fffffc05d6a8d00
[ 3.202633] ge2d: mapped phy: 0xd0160000
[ 3.206479] ge2d: ge2d start monitor
[ 3.210155] codec:Amlogic A/V streaming port init
[ 3.215270] codec:get gate demux control ok ffffffc073809980
[ 3.220306] ge2d: ge2d workqueue monitor start
[ 3.220344] codec:get gate parser_top control ok ffffffc073809d80
[ 3.220349] codec:get gate vpu_intr control ok ffffffc073809e80
[ 3.220354] codec:get gate vdec control ok ffffffc073809f80
[ 3.220549] codec:[tsync_pcr_init]init success.
[ 3.220581] codec:regist mpeg12 codec profile
[ 3.220613] codec:regist mpeg4 codec profile
[ 3.220614] codec:amvdec_vc1 module init
[ 3.220684] codec:regist vc1 codec profile
[ 3.220685] codec:amvdec_h264 module init
[ 3.220735] codec:regist h264 codec profile
[ 3.220736] codec:amvdec_h264mvc module init
[ 3.220782] codec:regist hmvc codec profile
[ 3.220783] codec:amvdec_h264_4k2k module init
[ 3.220815] codec:regist h264_4k2k codec profile
[ 3.220816] codec:amvdec_h265 module init
[ 3.220846] codec:regist hevc codec profile
[ 3.220879] codec:regist mjpeg codec profile
```



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[ 3.220880] codec:amvdec_real module init
[ 3.220915] codec:regist real codec profile
[ 3.220916] codec:amvdec_avs module init
[ 3.220946] codec:regist avs codec profile
[ 3.220985] amvenc_avc_probe -- reserved memory config fail.
[ 3.220987] amvenc_avc - cma memory pool size: 32 MB
[ 3.220999] encode_wq_init.
[ 3.221005] encode start monitor.
[ 3.221070] encode workqueue monitor start.
[ 3.221184] jpegenc module init
[ 3.221279] codec:picdec_driver_probe called.
[ 3.221282] picdec has 1 memory regions
[ 3.221300] picdec picdec.19: assigned reserved memory node
linux,picdec ok
[ 3.221302] codec:picdec_driver_probe done.
[ 3.221303] codec:reserved memory config fail , use CMA .
[ 3.223960] codec:cma memory is 64800000 , size is 3000000
[ 3.224319] codec:0 addr is 64800000#####
[ 3.224328] codec:1 addr is 64951800#####
[ 3.224473] switch_vpu_mem_pd: vpu_arb ON
[ 3.224703] codec:create_ge2d_work_queue video task ok
[ 3.224935] codec:register clk_set_setting cpu[31]
[ 3.225127] di_module_init ok.
[ 3.225132] di_module_init: major 241
[ 3.225250] di_probe
[ 3.225339] deinterlace has 1 memory regions
[ 3.225358] di reverser memory 0x76200000, size 30MB.
[ 3.225365] deinterlace deinterlace.21: assigned reserved memory
node linux,di ok
[ 3.225466] rdma_register, rdma_table_addr fffffff800064200
rdma_table_addr_phy 5fc4e000 reg_buf fffffffc073a4e000
[ 3.225468] rdma_register success, handle 1 table_size 8192
[ 3.225470] di_probe allocate rdma channel 1.
[ 3.225473] DI hw version 2.
[ 3.225480] 0x000000c3:Y=c3,U=0,V=0
[ 3.225481] 0x000000c4:Y=c4,U=0,V=0
[ 3.225483] 0x000000c5:Y=c5,U=0,V=0
[ 3.225485] 0x000000c6:Y=c6,U=0,V=0
[ 3.225486] 0x000000c7:Y=c7,U=0,V=0
[ 3.225488] 0x000000c8:Y=c8,U=0,V=0
[ 3.225489] 0x000000c9:Y=c9,U=0,V=0
[ 3.225492] 0x000000ca:Y=ca,U=0,V=0
[ 3.225494] 0x000000cb:Y=cb,U=0,V=0
[ 3.225496] 0x000000cc:Y=cc,U=0,V=0
[ 3.225498] 0x000000cd:Y=cd,U=0,V=0
[ 3.225500] 0x000000ce:Y=ce,U=0,V=0
[ 3.225502] 0x000000cf:Y=cf,U=0,V=0
[ 3.225614] di_probe here.
[ 3.225627] switch_vpu_mem_pd: di_pre OFF
[ 3.225776] efusekeynum: 4
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[ 3.225782] efusekeyname:          mac    offset:    0    size:
6
[ 3.225786] efusekeyname:          mac_bt  offset:    6    size:
6
[ 3.225791] efusekeyname:          mac_wifi offset:   12    size:
6
[ 3.225795] efusekeyname:          usid   offset:   18    size:
16
[ 3.225873] efuse efuse.7: probe OK!
[ 3.225991] []6aml_unifykeys_init done!
[ 3.225992] ppmgr module init func called
[ 3.226033] ppmgr_driver_probe called
[ 3.226036] ppmgr has 1 memory regions
[ 3.226043] init ppmgr memsource 74200000->761fffff
[ 3.226169] ppmgr_probe done
[ 3.226366] ionvideo-000: V4L2 device registered as video13
[ 3.226372] [dsp]register dsp to char divece(257)
[ 3.226640] amaudio: driver amaudio succuess!
[ 3.226644] amlvideo_init called
[ 3.226644] amlvideo_create_instance called
[ 3.226646] v4l2_dev.name=:amlvideo-000
[ 3.226701] amlvideo-000: V4L2 device registered as video10
[ 3.226703]

                VECM init

[ 3.226963] saradc c1108680.saradc: initialized by BL30
[ 3.226967] saradc c1108680.saradc: calibration start:
[ 3.227019] saradc c1108680.saradc: nominal=0, value=0
[ 3.227065] saradc c1108680.saradc: nominal=256, value=250
[ 3.227111] saradc c1108680.saradc: nominal=512, value=508
[ 3.227159] saradc c1108680.saradc: nominal=768, value=766
[ 3.227204] saradc c1108680.saradc: nominal=1023, value=1022
[ 3.227207] saradc c1108680.saradc: calibration end: coef=4064
[ 3.227246] remote: Driver init
[ 3.227285] remote: platform_data g_remote_ao_offset=580
[ 3.227287] remote: platform_data irq =228
[ 3.227313] remote: set drvdata completed
[ 3.227325] remote: device_create_file completed
[ 3.227612] input: aml_keypad as /devices/meson-remote.9/input/input0
[ 3.227752] remote: input_register_device completed
[ 3.227872] remote: [0x480] = 0x1dd0190
[ 3.227875] remote: [0x484] = 0xf800ca
[ 3.227877] remote: [0x488] = 0x82006e
[ 3.227880] remote: [0x48c] = 0x3c0030
[ 3.227882] remote: [0x490] = 0x30fa0013
[ 3.227891] remote: [0x498] = 0x6f19000
[ 3.227893] remote: [0x49c] = 0xbe40
[ 3.227895] remote: [0x580] = 0xfa00a0
[ 3.227897] remote: [0x584] = 0xfa00a0
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[ 3.227900] remote: [0x588] = 0xfa00a0
[ 3.227902] remote: [0x58c] = 0x640030
[ 3.227905] remote: [0x590] = 0x30fa0013
[ 3.227907] remote: [0x598] = 0x961b800
[ 3.227909] remote: [0x59c] = 0x9740
[ 3.227912] remote: [0x5a0] = 0x104
[ 3.227914] remote: [0x5a4] = 0x0
[ 3.227916] remote: [0x5a8] = 0x0
[ 3.227919] remote: set_remote_mode[72]
[ 3.227938] remote: remote config major:237
[ 3.228033] remote: physical address:0x73ae4000
[ 3.228395] aml-thermal : min state:1000000 400 1 2
[ 3.228576] aml-thermal : not found gpucore node
[ 3.228582] aml-thermal : gpu coef:437, pp:3
[ 3.233618] aml-thermal : cdev1 set upper to 4
[ 3.233622] aml-thermal : cdev0 set upper to 3
[ 3.236171] [6]-----
--
[ 3.236173] [6]odroid_sysfs_init(321) : Sleep Enable !!
[ 3.236174] [6]-----
--
[ 3.236308] input: vt-input as /devices/virtual/input/input1
[ 3.236376] [6]Virtual-Key input driver registered!!
[ 3.236809] adbattery: android dummy battery driver loaded
[ 3.237156] enter aml_soc_platform_pcm2bt_probe
[ 3.237370] divider=16,frac=33920000,SDMval=4523
[ 3.237474] enter aml_pcm_dai_probe
[ 3.237506] [aml-spdif-dai]enter aml_dai_spdif_init
[ 3.237554] aml_spdif_probe
[ 3.237649] enter spdif_dit_probe
[ 3.238310] odroid_hdmi_snd odroid_hdmi.36: dit-hifi <-> I2S.27
mapping ok
[ 3.238809] GACT probability on
[ 3.238812] Mirror/redirect action on
[ 3.238814] u32 classifier
[ 3.238815]     Performance counters on
[ 3.238816]     input device check on
[ 3.238817]     Actions configured
[ 3.238918] TCP: cubic registered
[ 3.238927] NET: Registered protocol family 17
[ 3.238959] NET: Registered protocol family 15
[ 3.239078] Bluetooth: RFCOMM TTY layer initialized
[ 3.239086] Bluetooth: RFCOMM socket layer initialized
[ 3.239094] Bluetooth: RFCOMM ver 1.11
[ 3.239100] Bluetooth: BNEP (Ethernet Emulation) ver 1.3
[ 3.239102] Bluetooth: BNEP filters: protocol multicast
[ 3.239107] Bluetooth: BNEP socket layer initialized
[ 3.239109] Bluetooth: HIDP (Human Interface Emulation) ver 1.2
[ 3.239114] Bluetooth: HIDP socket layer initialized
[ 3.239133] NET: Registered protocol family 35
```

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[ 3.239221] Key type dns_resolver registered
[ 3.239681] Registering SWP/SWPB emulation handler
[ 3.239963] AppArmor: AppArmor sha1 policy hashing enabled
[ 3.239992] regulator-dummy: disabling
[ 3.240109] drivers/rtc/hctosys.c: unable to open rtc device (rtc0)
[ 3.241554] input: cec_input as /devices/virtual/input/input2
[ 3.241956] genter meson_pm_probe!
[ 3.242043] meson_pm_probe done
[ 3.242164] ALSA device list:
[ 3.242166] #0: ODRROID-HDMI
[ 3.298167] usb 1-1.1: new full-speed USB device number 3 using
dwc_otg
[ 3.405873] input: Logitech USB Receiver as
/devices/dwc2_b/usb1/1-1/1-1.1/1-1.1:1.0/0003:046D:C52B.0001/input/inpu
t3
[ 3.406002] hid-generic 0003:046D:C52B.0001: input: USB HID v1.11
Keyboard [Logitech USB Receiver] on usb-dwc2_b-1.1/input0
[ 3.410386] input: Logitech USB Receiver as
/devices/dwc2_b/usb1/1-1/1-1.1/1-1.1:1.1/0003:046D:C52B.0002/input/inpu
t4
[ 3.410658] hid-generic 0003:046D:C52B.0002: input,hiddev0: USB HID
v1.11 Mouse [Logitech USB Receiver] on usb-dwc2_b-1.1/input1
[ 3.416109] hid-generic 0003:046D:C52B.0003: hiddev0: USB HID v1.11
Device [Logitech USB Receiver] on usb-dwc2_b-1.1/input2
[ 3.759952] random: nonblocking pool is initialized
[ 4.007750] Freeing unused kernel memory: 888K (ffffffc001ab6000 -
ffffffc001b94000)
[ 5.213130] switch_vpu_mem_pd: viu_vd1 OFF
[ 5.215908] switch_vpu_mem_pd: afbc_dec OFF
[ 5.218637] switch_vpu_mem_pd: di_post OFF
[ 5.222544] switch_vpu_mem_pd: viu_vd2 OFF
[ 8.528074] libphy: stmmac-0:00 - Link is Up - 1000/Full
[ 9.167962] systemd[1]: System time before build time, advancing
clock.
[ 9.274517] systemd[1]: Failed to insert module 'autofs4': No such
file or directory
[ 9.305792] systemd[1]: systemd 229 running in system mode. (+PAM
+AUDIT +SELINUX +IMA +APPARMOR +SMACK +SYSVINIT +UTMP +LIBCRYPTSETUP
+GCRYPT +GNUTLS +ACL +XZ -LZ4 +SECCOMP +BLKID +ELFUTILS +KMOD -IDN)
[ 9.324879] systemd[1]: Detected architecture arm64.
[ 9.358100] systemd[1]: Set hostname to <odroid64>.
[ 9.444715] ttyS0 use xtal 24000000 change 115200 to 115200
[ 10.065585] systemd[1]: Listening on Journal Socket (/dev/log).
[ 10.072699] systemd[1]: Reached target User and Group Name Lookups.
[ 10.080426] systemd[1]: Listening on /dev/initctl Compatibility
Named Pipe.
[ 10.088144] systemd[1]: Reached target Swap.
[ 10.094495] systemd[1]: Created slice User and Session Slice.
[ 10.100911] systemd[1]: Listening on udev Control Socket.
[ 10.107053] systemd[1]: Starting of Arbitrary Executable File
Formats File System Automount Point not supported.
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[ 10.141524] systemd[1]: Listening on Process Core Dump Socket.
[ 10.148554] systemd[1]: Listening on Syslog Socket.
[ 10.155295] systemd[1]: Reached target Encrypted Volumes.
[ 10.162421] systemd[1]: Created slice System Slice.
[ 10.169242] systemd[1]: Reached target Slices.
[ 10.176218] systemd[1]: Created slice system-serial\x2dgetty.slice.
[ 10.183909] systemd[1]: Listening on udev Kernel Socket.
[ 10.191005] systemd[1]: Listening on Journal Socket.
[ 10.205137] systemd[1]: Starting Load Kernel Modules...
[ 10.238261] systemd[1]: Started Read required files in advance.
[ 10.248331] systemd[1]: Mounting POSIX Message Queue File System...
[ 10.259093] systemd[1]: Mounting Debug File System...
[ 10.269620] systemd[1]: Starting Create Static Device Nodes in
/dev...
[ 10.279676] systemd[1]: Starting Braille Device Support...
[ 10.290835] systemd[1]: Starting Journal Service...
[ 10.305469] systemd[1]: Starting Nameserver information manager...
[ 10.315676] systemd[1]: Started Forward Password Requests to Wall
Directory Watch.
[ 10.327004] systemd[1]: Mounting Huge Pages File System...
[ 10.335512] systemd[1]: Created slice system-getty.slice.
[ 10.345500] systemd[1]: Starting Uncomplicated firewall...
[ 10.353820] systemd[1]: Reached target Remote File Systems (Pre).
[ 10.361526] systemd[1]: Reached target Remote File Systems.
[ 10.371158] systemd[1]: Starting Remount Root and Kernel File
Systems...
[ 10.383159] systemd[1]: systemd-modules-load.service: Main process
exited, code=exited, status=1/FAILURE
[ 10.392720] systemd[1]: Failed to start Load Kernel Modules.
[ 10.405309] systemd[1]: systemd-modules-load.service: Unit entered
failed state.
[ 10.410695] systemd[1]: systemd-modules-load.service: Failed with
result 'exit-code'.
[ 10.425451] systemd[1]: Starting Apply Kernel Variables...
[ 10.438512] systemd[1]: Mounting Configuration File System...
[ 10.448841] systemd[1]: Started Uncomplicated firewall.
[ 10.459987] systemd[1]: Started Remount Root and Kernel File
Systems.
[ 10.483796] systemd[1]: Starting Load/Save Random Seed...
[ 10.530977] systemd[1]: Starting udev Coldplug all Devices...
[ 10.542293] systemd[1]: Mounted Configuration File System.
[ 10.549300] systemd[1]: Mounted Huge Pages File System.
[ 10.556391] systemd[1]: Mounted POSIX Message Queue File System.
[ 10.563946] systemd[1]: Mounted Debug File System.
[ 10.592147] systemd[1]: ureadahead.service: Main process exited,
code=exited, status=5/NOTINSTALLED
[ 10.600000] systemd[1]: ureadahead.service: Unit entered failed
state.
[ 10.605548] systemd[1]: ureadahead.service: Failed with result
'exit-code'.
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[ 10.613517] systemd[1]: Started Journal Service.
[ 10.816369] systemd-journald[163]: Received request to flush runtime
journal from PID 1
[ 11.919484] ionvideo open
[ 12.117850] ionvideo_stop_generating!!!!
[ 12.117885] ionvideo release
[ 14.786634] FAT-fs (mmcblk0p1): Volume was not properly unmounted.
Some data may be corrupt. Please run fsck.
[ 15.613629] cgroup: new mount options do not match the existing
superblock, will be ignored
[ 19.797448] fb: osd[0] canvas.idx =0x40
[ 19.797451] fb: osd[0] canvas.addr=0x78000000
[ 19.797453] fb: osd[0] canvas.width=5120
[ 19.797455] fb: osd[0] canvas.height=720
[ 19.813291] fb: osd[0] enable: 0 (Xorg)
[ 20.336593] ttyS0 use xtal 24000000 change 115200 to 115200
[ 20.336987] ttyS0 use xtal 24000000 change 115200 to 115200
[ 20.706822] ttyS0 use xtal 24000000 change 115200 to 115200
[ 20.707164] ttyS0 use xtal 24000000 change 115200 to 115200
[ 20.731801] fb: osd[0] enable: 1 (Xorg)
[ 27.179220] divider=17,frac=80768000,SDMval=11722
[ 27.179265] i2sin_fifo0_set_buf
[ 27.179357] i2sin_fifo0_set_buf
[ 27.306069] i2sin_fifo0_set_buf
[ 27.306184] i2sin_fifo0_set_buf
[ 27.311613] [aml-i2s-dai]i2s dma fffffff800064a000,phy addr
1606811648,mode 0,ch 1
[ 27.311627] ----
aml_hw_iec958_init,runtime->rate=44100,sample_rate=5--
[ 27.311631] aml_set_spdif_clk rate
[ 27.311650] divider=22,frac=13030400,SDMval=2364
[ 27.311699] set normal 512 fs /4 fs
[ 27.311706] iec958 mode PCM16
[ 27.311714] IEC958 16bit
[ 27.311720] hdmitx: audio: aout notify rate 44100
[ 27.311723] hdmitx: audio: aout notify size 16
[ 27.311727] 958 with i2s
[ 27.311820] [aml-i2s-dai]i2s dma fffffff800064a000,phy addr
1606811648,mode 0,ch 1
[ 27.311825] ----
aml_hw_iec958_init,runtime->rate=44100,sample_rate=5--
[ 27.311828] aml_set_spdif_clk rate
[ 27.311833] divider=22,frac=13030400,SDMval=2364
[ 27.311838] set normal 512 fs /4 fs
[ 27.311843] iec958 mode PCM16
[ 27.311849] IEC958 16bit
[ 27.311853] hdmitx: audio: aout notify rate 44100
[ 27.311856] hdmitx: audio: aout notify size 16
[ 27.311859] 958 with i2s
[ 27.346735] i2sin_fifo0_set_buf
[ 27.346819] i2sin_fifo0_set_buf
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[ 27.348051] i2sin_fifo0_set_buf
[ 27.348131] i2sin_fifo0_set_buf
[ 27.349164] [aml-i2s-dai]i2s dma fffffff800064a000,phy addr
1606811648,mode 0,ch 2
[ 27.349175] ----
aml_hw_iec958_init,runtime->rate=44100,sample_rate=5--
[ 27.349179] aml_set_spdif_clk rate
[ 27.349191] divider=22,frac=13030400,SDMval=2364
[ 27.349202] set normal 512 fs /4 fs
[ 27.349208] iec958 mode PCM16
[ 27.349216] IEC958 16bit
[ 27.349221] hdmitx: audio: aout notify rate 44100
[ 27.349225] hdmitx: audio: aout notify size 16
[ 27.349229] 958 with i2s
[ 27.349289] [aml-i2s-dai]i2s dma fffffff800064a000,phy addr
1606811648,mode 0,ch 2
[ 27.349293] ----
aml_hw_iec958_init,runtime->rate=44100,sample_rate=5--
[ 27.349296] aml_set_spdif_clk rate
[ 27.349301] divider=22,frac=13030400,SDMval=2364
[ 27.349307] set normal 512 fs /4 fs
[ 27.349311] iec958 mode PCM16
[ 27.349317] IEC958 16bit
[ 27.349321] hdmitx: audio: aout notify rate 44100
[ 27.349324] hdmitx: audio: aout notify size 16
[ 27.349328] 958 with i2s
[ 27.349940] i2sin_fifo0_set_buf
[ 27.350000] i2sin_fifo0_set_buf
[ 27.350570] i2sin_fifo0_set_buf
[ 27.350627] i2sin_fifo0_set_buf
[ 27.359892] [aml-i2s-dai]i2s dma fffffff800064a000,phy addr
1606811648,mode 0,ch 2
[ 27.359904] ----
aml_hw_iec958_init,runtime->rate=44100,sample_rate=5--
[ 27.359908] aml_set_spdif_clk rate
[ 27.359919] divider=22,frac=13030400,SDMval=2364
[ 27.359930] set normal 512 fs /4 fs
[ 27.359936] iec958 mode PCM16
[ 27.359944] IEC958 16bit
[ 27.359950] hdmitx: audio: aout notify rate 44100
[ 27.359953] hdmitx: audio: aout notify size 16
[ 27.359957] 958 with i2s
[ 27.360033] [aml-i2s-dai]i2s dma fffffff800064a000,phy addr
1606811648,mode 0,ch 2
[ 27.360038] ----
aml_hw_iec958_init,runtime->rate=44100,sample_rate=5--
[ 27.360041] aml_set_spdif_clk rate
[ 27.360046] divider=22,frac=13030400,SDMval=2364
[ 27.360052] set normal 512 fs /4 fs
[ 27.360056] iec958 mode PCM16
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[ 27.360062] IEC958 16bit
[ 27.360065] hdmitx: audio: aout notify rate 44100
[ 27.360069] hdmitx: audio: aout notify size 16
[ 27.360072] 958 with i2s
[ 27.386112] aiu i2s playback enable
[ 27.386135] audio_hw_958_enable 1
[ 27.387510] i2sin_fifo0_set_buf
[ 27.387767] i2sin_fifo0_set_buf
[ 32.958858] aiu i2s playback disable
[ 32.958872] audio_hw_958_enable 0
[ 620.724657] fb: osd[0] enable: 1 (Xorg)
[ 620.733188] fb: osd[0] enable: 0 (Xorg)
[ 620.753128] fb: osd[0] enable: 0 (Xorg)
```

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Last update: **2018/03/15 15:55**

