



* Open Nand flash driver, MTD driver and Yaffs driver in linux kernel

☆ nand flash

Device Drivers --->

Memory Technology Devices (MTD) --->

NAND Flash Device Drivers --->

[*] NAND Device Support

[] Verify NAND page writes

[] DiskOnChip 2000, Millennium and Millennium Plus (NAND reimplementation) (EXPERIMENTAL)

[] Support for NAND Flash Simulator

[*] Realtek Mars NAND Flash Driver

☆ MTD:

[*] Memory Technology Device (MTD) support

[] Debugging

[] MTD concatenating support

[*] MTD partitioning support

[] RedBoot partition table parsing

[*] Command line partition table parsing

--- User Modules And Translation Layers

[*] Direct char device access to MTD devices

[*] Caching block device access to MTD devices

.....

☆ Yaffs

File systems --->

Miscellaneous filesystems --->

[*] YAFFS2 file system support

--- 512 byte / page devices

[] Use older-style on-NAND data format with pageStatus byte

[] Lets Yaffs do its own ECC

--- 2048 byte (or larger) / page devices

[*] Autoselect yaffs2 format

[*] Disable lazy loading

[] Turn off wide tnodes

[] Force chunk erase check

[*] Cache short names in RAM

* Nand and Yaffs Utilities:

First, you have to set gcc compiler as mipsel-linux-gcc 2.96-sdelinuxmips-040127 and then check out the sources from svn:

http://cadinfo.realtek.com.tw/svn/col/DVR/venus/software/system/OS/Linux/system/ap/develop/nand_yaffs

☆ Yaffs Utilities: mkyaffs2image

```
[ken@Nina nand_yaffs]$ cd yaffs2/utils/
```

```
[ken@Nina utils]$ make
```

usage: mkyaffs2image dir image_file

ex: # ./mkyaffs2image /mnt/sda1/test_yaffs usb.yaffs2

mkyaffs2image: image building tool for YAFFS2 built Sep 26 2008

Processing directory /mnt/sda1/test_yaffs into image file usb.yaffs2

Object 257, /mnt/sda1/test_yaffs/dd_05_2698.mp3 is a file, 2698 data chunks written

Object 258, /mnt/sda1/test_yaffs/mkyaffs2image is a file, 12 data chunks written

.....

Object 276, /mnt/sda1/test_yaffs/test1/plpho_cl_eng.c is a file, 3 data chunks written

Object 277, /mnt/sda1/test_yaffs/test1.yaffs2 is a file, 6 data chunks written

Operation complete.

21 objects in 4 directories

3013 NAND pages

☆ Nand Utilities: nandwrite, nanddump, flash_erase and flash_eraseall

You can use nandwrite to write yaffs image into nand flash and then mount it.

You can know the tool usage by typing "./nandwrite --help".

```
[ken@Nina nand_yaffs]$ cd mtd/util/
```

```
[ken@Nina util]$ make
```

ex: / # ./nandwrite -e -y -n -o /dev/mtd/0 05.yaffs2

Writing data finishes !!

* You can know more about nand flash, mtd and yaffs driver status by concatenating some procs.

```
/ # cat /proc/nandinfo
```

nand_PartNum:HY27UT088G2A

nand_size:2147483648

chip_size:1073741824

block_size:262144

page_size:2048

oob_size:64

ppb:128

RBA:409

```

/ # cat /proc/mtd
dev:   size  erasesize  name
mtd0: 80000000 00040000 "rtk_nand"

/ # cat /proc/yaffs
Device 0 "rtk_nand"
startBlock..... 0
endBlock..... 8191
totalBytesPerChunk. 2048
nDataBytesPerChunk. 2048
chunkGroupBits..... 0
chunkGroupSize..... 1
nErasedBlocks..... 8192
nReservedBlocks.... 5
blocksInCheckpoint. 0
nTnodesCreated..... 0
nFreeTnodes..... 0
nObjectsCreated.... 200
nFreeObjects..... 96
nFreeChunks..... 1048576
nPageWrites..... 0
nPageReads..... 0
nBlockErasures..... 0
nGCCopies..... 0
garbageCollections. 0
passiveGCs..... 0
nRetriedWrites..... 0
nShortOpCaches..... 5
nRetireBlocks..... 0
eccFixed..... 0
eccUnfixed..... 0
tagsEccFixed..... 0
tagsEccUnfixed..... 0
cacheHits..... 0
nDeletedFiles..... 0
nUnlinkedFiles..... 0
nBackgroudDeletions 0
useNANDECC..... 1
isYaffs2..... 1
inbandTags..... 0

```

* Nand R/W Speed Benchmark:

Using linux command "cp" copies a MP3(file size is 5524414 Bytes) on DDR to nand flash. The Benchmark is made by measuring the speed from yaffs to nand flash and from low-level nand driver to nand flash with un/cache kernel. Test board is RTD1283-QA 4/50 and nand flash (MLC) board is 4.

☆ from yaffs to nand flash

	Uncache Kernel	cache Kernel with BBM
Read (MB/sec)	3.650907	15.778585
Write(MB/sec)	1.435723	2.287216

☆ from low-level nand driver to nand flash

	Uncache Kernel	cache Kernel with BBM
Read (MB/sec)	6.089729	16.243642
Write(MB/sec)	2.035122	2.342060