[mtd命令及制作ubi镜像做根文件系统](http://blog.csdn.net/sphone89/article/details/12022251)

2013-09-25 17:22 1177人阅读 [评论](http://blog.csdn.net/sphone89/article/details/12022251#comments)(0) [收藏](javascript:void(0);) [举报](http://blog.csdn.net/sphone89/article/details/12022251#report)

在linux2.6.28后才加入对ubifs的支持  
  
1 查看nand分区  
  
root@ubuntu:~# cat /proc/mtd  
dev:    size   erasesize  name  
mtd0: 00020000 00020000 "U-Boot-min"  
mtd1: 00240000 00020000 "U-Boot"  
mtd2: 00020000 00020000 "U-Boot Env"  
mtd3: 00440000 00020000 "Kernel"  
mtd4: 1f400000 00020000 "File System"  
mtd5: 00540000 00020000 "Reserved"  
  
root@ubuntu:~# cat /proc/partitions   
major minor  #blocks  name  
  
  31        0        128 mtdblock0  
  31        1       2304 mtdblock1  
  31        2        128 mtdblock2  
  31        3       4352 mtdblock3  
  31        4     512000 mtdblock4  
  31        5       5376 mtdblock5  
root@ubuntu:~#   
  
2、查看mtd4的信息   
root@ubuntu:~# mtdinfo -m 4 -u  
mtd4  
Name:                           File System  
Type:                           nand  
Eraseblock size:                131072 bytes, 128.0 KiB  
Amount of eraseblocks:          4000 (524288000 bytes, 500.0 MiB)  
Minimum input/output unit size: 2048 bytes  
Sub-page size:                  512 bytes  
OOB size:                       64 bytes  
Character device major/minor:   90:8  
Bad blocks are allowed:         true  
Device is writable:             true  
Default UBI VID header offset:  512  
Default UBI data offset:        2048  
Default UBI LEB size:           129024 bytes, 126.0 KiB  
Maximum UBI volumes count:      128  
  
root@ubuntu:~# mtdinfo -m 2 -u   
或  
root@ubuntu:~# mtdinfo /dev/mtd4  
mtd2  
Name:                           U-Boot Env  
Type:                           nand  
Eraseblock size:                131072 bytes, 128.0 KiB    // FLASH物理擦除块大小  
Amount of eraseblocks:          1 (131072 bytes, 128.0 KiB)  
Minimum input/output unit size: 2048 bytes    1）nor flash:通常是1个字节  2）nand falsh：一个页面   
Sub-page size:                  512 bytes  //对于nand flash来说，子页大小   
OOB size:                       64 bytes  
Character device major/minor:   90:4  
Bad blocks are allowed:         true  
Device is writable:             true  
Default UBI VID header offset:  512  
Default UBI data offset:        2048  
Default UBI LEB size:           129024 bytes, 126.0 KiB  //逻辑擦除块大小  
Maximum UBI volumes count:      128  
  
mtd4大小为500MiB,擦除单元大小(一般即为块大小)为128KiB，名字是"NAND simulator partition 0"。 NandFlash  
  
擦除是以块(block)为单位，读写是以页(page)为单位。  
  
3 root@ubuntu:~# ls -lah /dev/mtd\*  
crw------- 1 root root 90,  0 Jan  1 00:00 /dev/mtd0 //字符设备  
crw------- 1 root root 90,  1 Jan  1 00:00 /dev/mtd0ro  
crw------- 1 root root 90,  2 Jan  1 00:00 /dev/mtd1  
crw------- 1 root root 90,  3 Jan  1 00:00 /dev/mtd1ro  
crw------- 1 root root 90,  4 Jan  1 00:00 /dev/mtd2  
crw------- 1 root root 90,  5 Jan  1 00:00 /dev/mtd2ro  
crw------- 1 root root 90,  6 Jan  1 00:00 /dev/mtd3  
crw------- 1 root root 90,  7 Jan  1 00:00 /dev/mtd3ro  
crw------- 1 root root 90,  8 Jan  1 00:00 /dev/mtd4  
crw------- 1 root root 90,  9 Jan  1 00:00 /dev/mtd4ro  
crw------- 1 root root 90, 10 Jan  1 00:00 /dev/mtd5  
crw------- 1 root root 90, 11 Jan  1 00:00 /dev/mtd5ro  
brw-rw---- 1 root disk 31,  0 Jan  1 00:00 /dev/mtdblock0  //块设备，与mtd0对应  
brw-rw---- 1 root disk 31,  1 Jan  1 00:00 /dev/mtdblock1  
brw-rw---- 1 root disk 31,  2 Jan  1 00:00 /dev/mtdblock2  
brw-rw---- 1 root disk 31,  3 Jan  1 00:00 /dev/mtdblock3  
brw-rw---- 1 root disk 31,  4 Jan  1 00:00 /dev/mtdblock4  
brw-rw---- 1 root disk 31,  5 Jan  1 00:00 /dev/mtdblock5  
root@ubuntu:~#   
  
  
4.   
关于mtd工具集的安装  
    sudo apt-get install mtd-utils  
UBI文件系统镜像文件的制作  
@ubuntu:~$ sudo mkfs.ubifs -r targetfs -m 2048 -e 129024 -c 3900 -o ubifs.img  
@ubuntu:~$ sudo ubinize -o ubi.img -m 2048 -p 128KiB -s 512 ubinize.cfg  
  
关于mkfs.ubifs参数的算法  
  -m minimum I/O unit size  
  -e, --leb-size=SIZE      logical erase block size  
  -c maximum logical erase block count  
  -x compression type - "lzo", "favor\_lzo", "zlib" or "none" (default: "lzo")  
  -p size of the physical eraseblock of the flash this UBI image is created for in bytes  
  
wear\_level\_reserved\_blocks is 1% of total blcoks per device  
\*logical\_erase\_block\_size\* is physical erase block size minus 2 pages for UBI  
Block size = page\_size \* pages\_per\_block  
physical blocks on a partition = partition size / block size  
Logical blocks on a partition = physical blocks on a partitiion - reserved for wear level  
File-system volume = Logical blocks in a partition \* Logical erase block size  
  
关于参数可以参考attach的命令输出：  
  
root@ubuntu:~# ubiattach  /dev/ubi\_ctrl -m 4 -d 0  
UBI device number 0, total 4000 LEBs (516096000 bytes, 492.2 MiB), available 0 LEBs (0 bytes), LEB  
  
size 129024 bytes (126.0 KiB)  
root@ubuntu:~#   
  
ubinize.cfg文件  
  
[ubifs]  
mode=ubi  
image=ubifs.img  
vol\_id=0  
vol\_size=450MiB  
vol\_type=dynamic  
vol\_alignment=1  
vol\_name=rootfs  
vol\_flags=autoresize  
  
  
5. UBI文件系统镜像在Linux下的烧写  
flash\_eraseall /dev/mtd4  
ubiformat /dev/mtd4 -s 512 -f /xxx/ubi.img  
  
6、 UBI文件系统镜像在U-BOOT下的烧写  
//load ubi image to RAM  
tftp ubi.img  
//erase MTD4 nand space  
nand erase 0x6c0000 0xc820000  
//write image to nand  
nand write.i 0x81000000 0x6c0000 0xxxxx(image size)  
  
7. UBI文件系统镜像在Linux下的挂载和卸载  
  
挂载  
ubiattach /dev/ubi\_ctrl -m 4 -d 0  
mount -t ubifs ubi0\_0 /mnt/ubi  
  
  
卸载  
umount /mnt/ubi  
ubidetach -d 0  
  
8、使用ubi做根文件系统  
需要在bootargs中设置如下信息：

  root=ubi0:rootfs ubi.mtd=4 rootfstype=ubifs

 配置linux内核  
           配置的时候选上  
          1)Device Drivers  --->Memory Technology Device (MTD) support  --->UBI - Unsorted block images  --->Enable UBI  
          2)File systems  --->Miscellaneous filesystems  --->UBIFS file system support  
          这样我们的内核就支持UBIFS文件系统了