kernel 3.18.7

以drivers/base/,fs/目录下code为例

对其目录下Makefile修改如下

drivers/base/

drivers/base/Makefile

```
1.  ccflags-y = -DDEBUG -O0 -g
2.  subdir-ccflags-y = -O0 -g
```

drivers/base/power/Makefile

```
1.  CFLAGS_wakeup.o = -O1 -g
```

fs/

fs/Makefile

```
1.  ccflags-y = -O0 -g
2.  subdir-ccflags-y = -O0 -g
3.  CFLAGS_exec.o = -O1 -g
4.  CFLAGS_fcntl.o = -O1 -g
5.  CFLAGS_dcache.o = -O1 -g
6.  CFLAGS_file.o = -O1 -g
7.  CFLAGS_namespace.o = -O1 -g
8.  CFLAGS_pnode.o = -O1 -g
9.  CFLAGS_eventpoll.o = -O1 -g
10. CFLAGS_eventfd.o = -O1 -g
11. CFLAGS_timerfd.o = -O1 -g
12. CFLAGS_aio.o = -O1 -g
13. CFLAGS_posix_acl.o = -O1 -g
```

fs/kernfs/Makefile

```
1.  CFLAGS_mount.o = -O1 -g
```

fs/ext4/Makefile

```
1.  CFLAGS_inline.o = -O1 -g
2.  CFLAGS_mballoc.o = -O1 -g
```

fs/ramfs/Makefile

```
1.  CFLAGS_inode.o = -O1 -g
```

fs/proc/Makefile

```
1.  CFLAGS_task_mmu.o = -O1 -g
```

fs/notify/Makefile

```
1.  CFLAGS_inode_mark.o = -O1 -g
2.  CFLAGS_vfsmount_mark.o = -O1 -g
```

fs/nfs/Makefile

```
1.  CFLAGS_client.o = -O1 -g
2.  CFLAGS_nfs4namespace.o = -O1 -g
3.  CFLAGS_delegation.o = -O1 -g
```

build kernel,在链接vmlinux时报如下错

```
  1.    fs/built-in.o: In function `__cmpxchg':
  2.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/arch/arm/include/asm/cmpxchg.h:185: undefined re
       ference to `__bad_cmpxchg'
  3.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/arch/arm/include/asm/cmpxchg.h:185: undefined re
       ference to `__bad_cmpxchg'
  4.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/arch/arm/include/asm/cmpxchg.h:185: undefined re
       ference to `__bad_cmpxchg'
  5.   | fs/built-in.o: In function `elf_core_dump':
  6.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/fs/binfmt_elf.c:2094: undefined reference to `__
       aeabi_ldivmod'
  7.   | fs/built-in.o: In function `__cmpxchg':
  8.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/arch/arm/include/asm/cmpxchg.h:185: undefined re
       ference to `__bad_cmpxchg'
  9.   | fs/built-in.o: In function `merge_note_headers_elf64':
 10.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/fs/proc/vmcore.c:664: undefined reference to `__
       aeabi_uldivmod'
 11.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/fs/proc/vmcore.c:678: undefined reference to `__
       aeabi_uldivmod'
 12.   | fs/built-in.o: In function `merge_note_headers_elf32':
 13.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/fs/proc/vmcore.c:850: undefined reference to `__
       aeabi_uldivmod'
 14.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/fs/proc/vmcore.c:864: undefined reference to `__
       aeabi_uldivmod'
 15.   | fs/built-in.o: In function `process_ptload_program_headers_elf64':
 16.   | /home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/build/tmp/work-sh
       ared/granite2/kernel-source/fs/proc/vmcore.c:914: undefined reference to `__
       aeabi_uldivmod'
 17.   | fs/built-in.o:/home/walterzh/work/2016-05-LSP/gerrit/build-bundle/poky/bui
       ld/tmp/work-shared/granite2/kernel-source/fs/proc/vmcore.c:957: more undefin
       ed references to `__aeabi_uldivmod' follow
 18.   | make[2]: *** [vmlinux] Error 1
```

这里分为2种错。

1. undefined `__aeabi_uldivmod`

   in fs/proc/vmcore.c

   > phdr.p_offset = roundup(note_off, PAGE_SIZE);

in include/linux/kernel.h

```
1.  /* The `const' in roundup() prevents gcc-3.3 from calling __divdi3 */
2.  #define roundup(x, y) (                     \
3.  {                                  \
4.      const typeof(y) __y = y;           \
5.      (((x) + (__y - 1)) / __y) * __y;        \
6.  }                                  \
```

这里的"/"被gcc解释成对 `__aeabi_uldivmod` gcc库函数的调用。

解决方案是对这些文件还是要优化，而且只有-O2才行。

in fs/Makefile

> CFLAGS_binfmt_elf.o = -O2 -g

in fs/proc/Makefile

> CFLAGS_vmcore.o = -O2 -g

1. undefined `__bad_cmpxchg`

   in arch/arm/include/asm/cmpxchg.h

   > extern void __bad_cmpxchg(volatile void *ptr, int size);
   > 只是引用到了__bad_cmpxchg,但没有地方定义。根据google搜索到的solution.

in arch/arm/kernel/traps.h添加如下定义

```
1.  void __bad_cmpxchg(volatile void *ptr, int size)
2.  {
3.      printk("cmpxchg: bad data size: pc 0x%p, ptr 0x%p, size %d\n",
4.          __builtin_return_address(0), ptr, size);
5.      BUG();
6.  }
7.  EXPORT_SYMBOL(__bad_cmpxchg);
```

OK, vmlinux (ulmage)可以成功生成！

增加的modules

drivers/cpuidle/Makefile

```
1.  ccflags-y = -DDEBUG -O0 -g
2.  subdir-ccflags-y = -O0 -g
```

drivers/clocksource/Makefile

```
1.  ccflags-y = -DDEBUG -O0 -g
2.  subdir-ccflags-y = -O0 -g
```

drivers/input/Makefile

```
1.  ccflags-y = -DDEBUG -O0 -g
2.  subdir-ccflags-y = -O0 -g
3.  CFLAGS_input-mt.o = -O1 -g
4.  CFLAGS_ff-core.o = -O1 -g
5.  CFLAGS_input.o = -O1 -g
6.  CFLAGS_evdev.o = -O1 -g
7.  CFLAGS_mousedev.o = -O1 -g
```

drivers/pinctrl/Makefile

```
1.  ccflags-y = -DDEBUG -O0 -g
2.  subdir-ccflags-y = -O0 -g
```

drivers/of/Makefile

```
1.  ccflags-y = -DDEBUG -O0 -g
2.  subdir-ccflags-y = -O0 -g
```