

in Documentation/kernel-parameters.txt

threadirqs [KNL]

Force threading of all interrupt handlers except those
marked explicitly IRQF_NO_THREAD.

启动参数未加threadirqs

bootcmd: mmc dev 2;ext2load mmc 2:2 0x400000 /boot/ulmage;ext2load mmc 2:2 0xf00000
/boot/mv6270-toc-revc.dtb;setenv bootargs \$bootargs root=/dev/mmcblk1p2
uio_pdrv_genirq.of_id=generic-uio rootwait;bootm 0x400000 - 0xf00000

root@granite2:~# ps

PID	USER	VSZ	STAT	COMMAND
1	root	1692	S	init [5]
2	root	0	SW	[kthreadd]
3	root	0	SW	[ksoftirqd/0]
4	root	0	SW	[kworker/0:0]
5	root	0	SW<	[kworker/0:0H]
6	root	0	SW	[kworker/u8:0]
7	root	0	SW	[rcu_preempt]
8	root	0	SW	[rcu_sched]
9	root	0	SW	[rcu_bh]
10	root	0	SW	[migration/0]
11	root	0	SW	[migration/1]

12 root	0 SW	[ksoftirqd/1]
13 root	0 SW	[kworker/1:0]
14 root	0 SW<	[kworker/1:0H]
15 root	0 SW	[migration/2]
16 root	0 SW	[ksoftirqd/2]
17 root	0 SW	[kworker/2:0]
18 root	0 SW<	[kworker/2:0H]
19 root	0 SW	[migration/3]
20 root	0 SW	[ksoftirqd/3]
21 root	0 SW	[kworker/3:0]
22 root	0 SW<	[kworker/3:0H]
23 root	0 SW<	[khelper]
24 root	0 SW	[kdevtmpfs]
25 root	0 SW	[kworker/u8:1]
483 root	0 SW<	[writeback]
486 root	0 SW	[kworker/0:1]
487 root	0 SW<	[bioset]
489 root	0 SW<	[kblockd]
497 root	0 SW<	[ata_sff]
531 root	0 SW<	[cfg80211]
614 root	0 SW	[kworker/1:1]
615 root	0 SW<	[rpciod]
626 root	0 SW	[kswapd0]
627 root	0 SW	[fsnotify_mark]
628 root	0 SW<	[nfsiod]

640 root	0 SW	[kworker/2:1]
648 root	0 SW	[d07c0000.m2m]
650 root	0 SW	[d07d0000.m2m]
1159 root	0 SW	[kworker/3:1]
1233 root	0 SW<	[kpsmoused]
1241 root	0 SW	[irq/57-mmc0]
1244 root	0 SW	[irq/70-mmc1]
1245 root	0 SW	[kworker/u8:2]
1248 root	0 SW	[mmcqd/0]
1250 root	0 SW	[mmcqd/0boot0]
1251 root	0 SW	[mmcqd/0boot1]
1252 root	0 SW	[mmcqd/0rpmb]
1261 root	0 SW	[irq/71-mmc2]
1272 root	0 SW<	[deferwq]
1274 root	0 SW	[mmcqd/2]
1280 root	0 SW<	[kworker/0:1H]
1281 root	0 SW	[kjournald]
1302 root	3076 S	/lib/udev/udev -d
1477 root	0 SW<	[ipc_wq]
1503 root	0 SW	[scsi_eh_0]
1504 root	0 SW<	[scsi_tmf_0]
1509 root	0 SW<	[kworker/1:1H]
1551 root	0 SW	[irq/544-vbus]
1603 root	0 SW	[irq/226-ICETEST]
1611 root	0 SW	[irq/222-PIE]

```

1616 root      0 SW   [irq/227-CISX]
1620 root      0 SW   [irq/225-SCANBLK]
1628 root      0 SW   [irq/223-PIC]
1629 root      0 SW   [st status]
1636 root      0 SW   [irq/224-PIC]
1639 root    3072 S   /lib/udev/udev -d
1783 root      0 SW<  [ipv6_addrconf]
1784 root    2228 S   /usr/sbin/rpcbind
1804 root      0 SW<  [galcore workque]
1805 root      0 SW   [galcore daemon ]
1806 root    3072 S   /lib/udev/udev -d
1815 messageb 2764 S   /usr/bin/dbus-daemon --system
1822 root    4312 S   /usr/sbin/sshd
1830 root    8048 S   /usr/sbin/named
1842 root    2244 S   /sbin/syslogd -n -O /var/log/messages
1845 root    2244 S   /sbin/klogd -n
1849 root    3032 S   -sh
1850 root    2248 S   /sbin/getty 38400 tty1
1852 root    2576 R   ps

```

添加threadirqs

```

# mmc dev 2;ext2load mmc 2:2 0x400000 /boot/ulmage;ext2load mmc 2:2 0xf00000 /boot/mv6270-
toc-revc.dtb;setenv bootargs $bootargs root=/dev/mmcblk1p2 uio_pdrv_genirq.of_id=generic-uio
rootwait threadirqs;bootm 0x400000 - 0xf00000

```

root@granite2:~# ps

PID	USER	VSZ	STAT	COMMAND
1	root	1692	S	init [5]
2	root	0	SW	[kthreadd]
3	root	0	SW	[ksoftirqd/0]
4	root	0	SW	[kworker/0:0]
5	root	0	SW<	[kworker/0:0H]
6	root	0	SW	[kworker/u8:0]
7	root	0	SW	[rcu_preempt]
8	root	0	SW	[rcu_sched]
9	root	0	SW	[rcu_bh]
10	root	0	SW	[migration/0]
11	root	0	SW	[migration/1]
12	root	0	SW	[ksoftirqd/1]
13	root	0	SW	[kworker/1:0]
14	root	0	SW<	[kworker/1:0H]
15	root	0	SW	[migration/2]
16	root	0	SW	[ksoftirqd/2]
17	root	0	SW	[kworker/2:0]
18	root	0	SW<	[kworker/2:0H]
19	root	0	SW	[migration/3]
20	root	0	SW	[ksoftirqd/3]
21	root	0	SW	[kworker/3:0]
22	root	0	SW<	[kworker/3:0H]
23	root	0	SW<	[khelper]

24 root	0 SW	[kdevtmpfs]
25 root	0 SW	[kworker/u8:1]
483 root	0 SW<	[writeback]
486 root	0 SW	[kworker/0:1]
487 root	0 SW<	[bioset]
489 root	0 SW<	[kblockd]
497 root	0 SW<	[ata_sff]
531 root	0 SW<	[cfg80211]
614 root	0 SW	[kworker/1:1]
615 root	0 SW<	[rpciod]
626 root	0 SW	[kswapd0]
627 root	0 SW	[fsnotify_mark]
628 root	0 SW<	[nfsiod]
638 root	0 SW	[kworker/2:1]
646 root	0 SW	[irq/59-Mrvl LCD]
649 root	0 SW	[d07c0000.m2m]
650 root	0 SW	[irq/138-d07c000]
652 root	0 SW	[d07d0000.m2m]
653 root	0 SW	[irq/139-d07d000]
1159 root	0 SW	[kworker/3:1]
1204 root	0 SW	[irq/238-pip_irq]
1206 root	0 SW	[irq/176-zx_idma]
1208 root	0 SW	[irq/206-jpeg_ui]
1210 root	0 SW	[irq/207-jpeg_ui]
1212 root	0 SW	[irq/190-jbig-co]

1214 root	0 SW	[irq/195-jbig-co]
1216 root	0 SW	[irq/200-jbig-co]
1218 root	0 SW	[irq/191-jbig-co]
1220 root	0 SW	[irq/196-jbig-co]
1222 root	0 SW	[irq/201-jbig-co]
1224 root	0 SW	[irq/192-jbig-co]
1226 root	0 SW	[irq/197-jbig-co]
1228 root	0 SW	[irq/202-jbig-co]
1230 root	0 SW	[irq/193-jbig-co]
1232 root	0 SW	[irq/198-jbig-co]
1234 root	0 SW	[irq/203-jbig-co]
1236 root	0 SW	[irq/194-jbig-fa]
1238 root	0 SW	[irq/199-jbig-fa]
1240 root	0 SW	[irq/204-jbig-fa]
1242 root	0 SW	[irq/243-antic_u]
1244 root	0 SW	[irq/205-rotate_]
1252 root	0 SW	[irq/64-mv-pegma]
1258 root	0 SW<	[kpsmoused]
1263 root	0 SW	[irq/37-d0626800]
1267 root	0 SW	[irq/57-mmc0]
1270 root	0 SW	[irq/70-mmc1]
1271 root	0 SW	[kworker/u8:2]
1275 root	0 SW	[mmcqd/0]
1276 root	0 SW	[irq/71-mmc2]
1279 root	0 SW	[mmcqd/0boot0]

1280	root	0 SW	[mmcqd/0boot1]
1281	root	0 SW	[mmcqd/0rpmb]
1298	root	0 SW<	[deferwq]
1301	root	0 SW	[mmcqd/2]
1307	root	0 SW<	[kworker/0:1H]
1308	root	0 SW	[kjournald]
1334	root	3076 S	/lib/udev/udev -d
1398	root	0 SW	[irq/55-d0625800]
1487	root	0 SW	[irq/39-d4011000]
1494	root	0 SW<	[ipc_wq]
1499	root	0 SW<	[kworker/3:1H]
1515	root	0 SW	[irq/66-d4240000]
1516	root	0 SW	[scsi_eh_0]
1517	root	0 SW<	[scsi_tmf_0]
1545	root	0 SW<	[kworker/1:1H]
1546	root	0 SW	[irq/208-stepper]
1550	root	0 SW	[irq/209-stepper]
1551	root	0 SW	[irq/210-stepper]
1554	root	0 SW	[irq/211-stepper]
1556	root	0 SW	[irq/212-stepper]
1557	root	0 SW	[irq/213-stepper]
1569	root	0 SW	[irq/221-mv61x0-]
1597	root	0 SW	[irq/64-d4224000]
1599	root	0 SW	[irq/544-vbus]
1602	root	0 SW	[irq/62-ehci_hcd]

1603	root	0	SW	[irq/88-d4033000]
1608	root	0	SW	[irq/61-ehci_hcd]
1655	root	0	SW	[irq/226-ICETEST]
1659	root	3072	S	/lib/udev/udev -d
1660	root	3072	S	/lib/udev/udev -d
1672	root	0	SW	[irq/283-DEC ADC]
1673	root	0	SW	[irq/222-PIE]
1674	root	0	SW	[irq/223-PIC]
1676	root	0	SW	[irq/225-SCANBLK]
1679	root	0	SW	[st status]
1680	root	0	SW	[irq/224-PIC]
1681	root	0	SW	[irq/227-CISX]
1684	root	0	SW	[irq/236-marvell]
1696	root	0	SW	[irq/237-marvell]
1821	root	0	SW	[irq/47-eth0]
1840	root	0	SW<	[ipv6_addrconf]
1841	root	2228	S	/usr/sbin/rpcbind
1861	root	0	SW<	[galcore workque]
1862	root	0	SW	[galcore daemon]
1863	root	0	SW	[irq/85-galcore]
1872	messageb	2764	S	/usr/bin/dbus-daemon --system
1879	root	4312	S	/usr/sbin/sshd
1887	root	8048	S	/usr/sbin/named
1899	root	2244	S	/sbin/syslogd -n -O /var/log/messages
1902	root	2244	S	/sbin/klogd -n

```
1906 root    3032 S   -sh
1907 root    2248 S   /sbin/getty 38400 tty1
1909 root      0 SW   [irq/48-UART1]
1910 root    2576 R    ps
```

```
CONFIG_IRQ_FORCED_THREADING=y
```

in kernel/irq/manage.c

```
#ifdef CONFIG_IRQ_FORCED_THREADING
```

```
__read_mostly bool force_irqthreads;
```

```
static int __init setup_forced_irqthreads(char *arg)
```

```
{
```

```
    force_irqthreads = true;
```

```
    return 0;
```

```
}
```

```
early_param("threadirqs", setup_forced_irqthreads);
```

```
#endif
```

```
/*
```

```
 * Interrupt handler thread
```

```
*/
```

```
static int irq_thread(void *data)
```

```
{
```

```
struct callback_head on_exit_work;

struct irqaction *action = data;

struct irq_desc *desc = irq_to_desc(action->irq);

irqreturn_t (*handler_fn)(struct irq_desc *desc,
                           struct irqaction *action);
```

```
if (force_irqthreads && test_bit(IRQTF_FORCED_THREAD,
                                &action->thread_flags))
```

```
    handler_fn = irq_forced_thread_fn;
```

```
else
```

```
    handler_fn = irq_thread_fn;
```

```
init_task_work(&on_exit_work, irq_thread_dtor);

task_work_add(current, &on_exit_work, false);
```

```
irq_thread_check_affinity(desc, action);
```

```
while (!irq_wait_for_interrupt(action)) {
```

```
    irqreturn_t action_ret;
```

```
    irq_thread_check_affinity(desc, action);
```

```
    action_ret = handler_fn(desc, action);
```

```
    if (action_ret == IRQ_HANDLED)
```

```
        atomic_inc(&desc->threads_handled);
```

```
wake_threads_waitq(desc);

}

/*
 * This is the regular exit path. __free_irq() is stopping the
 * thread via kthread_stop() after calling
 * synchronize_irq(). So neither IRQTF_RUNTHREAD nor the
 * oneshot mask bit can be set. We cannot verify that as we
 * cannot touch the oneshot mask at this point anymore as
 * __setup_irq() might have given out current's thread_mask
 * again.
 */

task_work_cancel(current, irq_thread_dtor);

return 0;

}
```