

```

/*
 * A number of key systems in x86 including ioremap() rely on the assumption
 * that high_memory defines the upper bound on direct map memory, then end
 * of ZONE_NORMAL. Under CONFIG_DISCONTIG this means that max_low_pfn and
 * highstart_pfn must be the same; there must be no gap between ZONE_NORMAL
 * and ZONE_HIGHMEM.
 */

```

```
void * high_memory;
```

```
EXPORT_SYMBOL(high_memory);
```

*high_memory包含ZONE_NORMAL 和highmem的分界线。

- get the high_memory address from kernel elf symbol

```
walterzh$ nm vmlinux-3.18.7-yocto-standard | grep high_memory
```

```
c058fe8b r __kstrtab_high_memory
```

```
c0581ae0 R __ksymtab_high_memory
```

c0693d94 B high_memory

- high_memory = 0xc0693d94

physical address is 0xc0693d94 - 0xc0000000 = 0x00693d94

- devmem 0x00693d94

```
root@granite2:~# devmem 0x00693d94
```

```
0xEF800000
```

即*high_memory = 0xEF800000

- check the correction of *high_memory

There is the following log in Linux kernel boot log

Memory: 1028208K/1044480K available (4554K kernel code, 217K rwddata, 1356K rodata, 208K init, 448K bss, 16272K reserved, 270336K highmem)

Virtual kernel memory layout:

vector : 0xffff0000 - 0xffff1000 (4 kB)

fixmap : 0xffc00000 - 0xffe00000 (2048 kB)

vmalloc : 0xf0000000 - 0xff000000 (240 MB)

lowmem : 0xc0000000 - 0xef800000 (760 MB)

pkmap : 0xbfe00000 - 0xc0000000 (2 MB)

modules : 0xbf000000 - 0xbfe00000 (14 MB)

.text : 0xc0008000 - 0xc05cde80 (5912 kB)

.init : 0xc05ce000 - 0xc0602000 (208 kB)

.data : 0xc0602000 - 0xc0638728 (218 kB)

.bss : 0xc0638728 - 0xc06a8af4 (449 kB)

lowmem的上边界，也就是highmem的下边界，0xef800000.