

| Module | Size | Used by |
|------------------|--------|---|
| ppdev | 20480 | 0 |
| vboxvideo | 53248 | 1 |
| intel_powerclamp | 16384 | 0 |
| ttm | 98304 | 1 vboxvideo |
| drm_kms_helper | 155648 | 1 vboxvideo |
| snd_intel8x0 | 40960 | 0 |
| snd_ac97_codec | 131072 | 1 snd_intel8x0 |
| ac97_bus | 16384 | 1 snd_ac97_codec |
| input_leds | 16384 | 0 |
| serio_raw | 16384 | 0 |
| drm | 364544 | 4 ttm,drm_kms_helper,vboxvideo |
| joydev | 20480 | 0 |
| snd_pcm | 106496 | 2 snd_ac97_codec,snd_intel8x0 |
| snd_timer | 32768 | 1 snd_pcm |
| fb_sys_fops | 16384 | 1 drm_kms_helper |
| syscopyarea | 16384 | 2 drm_kms_helper,vboxvideo |
| snd | 81920 | 4 snd_ac97_codec,snd_intel8x0,snd_timer,snd_pcm |
| sysfillrect | 16384 | 2 drm_kms_helper,vboxvideo |
| i2c_piix4 | 24576 | 0 |
| soundcore | 16384 | 1 snd |
| sysimgblt | 16384 | 2 drm_kms_helper,vboxvideo |
| vboxguest | 286720 | 1 vboxvideo |
| parport_pc | 32768 | 0 |
| 8250_fintek | 16384 | 0 |
| parport | 49152 | 2 ppdev,parport_pc |
| mac_hid | 16384 | 0 |
| ib_iser | 49152 | 0 |
| rdma_cm | 49152 | 1 ib_iser |
| iw_cm | 45056 | 1 rdma_cm |
| ib_cm | 45056 | 1 rdma_cm |
| ib_sa | 36864 | 2 rdma_cm,ib_cm |
| ib_mad | 49152 | 2 ib_cm,ib_sa |
| ib_core | 106496 | 6 rdma_cm,ib_cm,ib_sa,iw_cm,ib_mad,ib_iser |
| ib_addr | 16384 | 2 rdma_cm,ib_core |
| iscsi_tcp | 20480 | 0 |

--More--

Archivo Máquina Ver Entrada Dispositivos Ayuda

```
#include <linux/kernel.h>
#include <linux/module.h>
#include <linux/hash.h>
#include <linux/gcd.h>
#include <asm/param.h>
#include <linux/jiffies.h>

int simple_init(void){

    printk(KERN_INFO "Loading Kernel Module\n");

    printk(KERN_INFO "%lu\n", GOLDEN_RATIO_PRIME);

    printk(KERN_INFO "Hz: %d\nJiffies: %lu\n", HZ, jiffies);

    printk(KERN_EMERG "Emmmmergency");

    return 0;
}

void simple_exit(void){

    printk(KERN_INFO "Removing Kernel Module\n");

    printk(KERN_INFO "%lu\n", gcd(3300,24));

    printk(KERN_INFO "%lu\n", jiffies);
}

module_init(simple_init);
module_exit(simple_exit);

MODULE_LICENSE("GPL");
MODULE_DESCRIPTION("Simple Module");
MODULE_AUTHOR("SGG");

osc@ubuntu:~$
```

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```
osc@ubuntu:~$ cat Makefile
obj-m += simple.o

all:
    make -C /lib/modules/$(shell uname -r)/build M=$(PWD) modules

clean:
    make -C /lib/modules/$(shell uname -r)/build M=$(PWD) clean

osc@ubuntu:~$ make
make -C /lib/modules/4.4.0-87-generic/build M=/home/osc modules
make[1]: Entering directory '/usr/src/linux-headers-4.4.0-87-generic'
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: Leaving directory '/usr/src/linux-headers-4.4.0-87-generic'
osc@ubuntu:~$
```

```
osc@ubuntu:~$ sudo insmod simple.ko
```

```
[sudo] password for osc:
```

```
osc@ubuntu:~$ dmesg
```

```
[ 6.583822] Console: switching to colour frame buffer device 100x37
[ 6.586297] vboxvideo 0000:00:02.0: fb0: vboxdrmfb frame buffer device
[ 6.586780] [drm] Initialized vboxvideo 1.0.0 20130823 for 0000:00:02.0 on minor 0
[ 6.664834] random: nonblocking pool is initialized
[ 6.755277] audit: type=1400 audit(1681311761.512:2): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="lxc-container-default" pid=724 comm="apparmor_parser"
[ 6.755281] audit: type=1400 audit(1681311761.512:3): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="lxc-container-default-cgns" pid=724 comm="apparmor_parser"
[ 6.755284] audit: type=1400 audit(1681311761.512:4): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="lxc-container-default-with-mounting" pid=724 comm="apparmor_parser"
[ 6.755286] audit: type=1400 audit(1681311761.512:5): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="lxc-container-default-with-nesting" pid=724 comm="apparmor_parser"
[ 6.759218] audit: type=1400 audit(1681311761.516:6): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/sbin/dhclient" pid=725 comm="apparmor_parser"
[ 6.759222] audit: type=1400 audit(1681311761.516:7): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/lib/NetworkManager/nm-dhcp-client.action" pid=725 comm="apparmor_parser"
[ 6.759224] audit: type=1400 audit(1681311761.516:8): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/lib/NetworkManager/nm-dhcp-helper" pid=725 comm="apparmor_parser"
[ 6.759226] audit: type=1400 audit(1681311761.516:9): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/lib/connman/scripts/dhclient-script" pid=725 comm="apparmor_parser"
[ 6.760142] audit: type=1400 audit(1681311761.520:10): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/bin/lxc-start" pid=727 comm="apparmor_parser"
[ 6.761117] audit: type=1400 audit(1681311761.520:11): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/lib/lxd/lxd-bridge-proxy" pid=728 comm="apparmor_parser"
[ 6.805315] IPv6: ADDRCONF(NETDEV_UP): enp0s3: link is not ready
[ 6.808302] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[ 6.808581] IPv6: ADDRCONF(NETDEV_CHANGE): enp0s3: link becomes ready
[ 6.893790] cgroup: new mount options do not match the existing superblock, will be ignored
[ 9.332010] floppy0: no floppy controllers found
[ 35.546480] simple: module verification failed: signature and/or required key missing - tainting
kernel
[ 35.547010] Loading Kernel Module
[ 35.547011] 11400862456688148481
[ 35.547012] Hz: 250
Jiffies: 4294901137
osc@ubuntu:~$ lsmod | more
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| vboxvideo | 53248 | 1 |
| ttm | 98304 | 1 vboxvideo |
| drm_kms_helper | 155648 | 1 vboxvideo |
| snd_intel8x0 | 40960 | 0 |
| snd_ac97_codec | 131072 | 1 snd_intel8x0 |
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| serio_raw | 16384 | 0 |
| joydev | 20480 | 0 |
| ac97_bus | 16384 | 1 snd_ac97_codec |
| drm | 364544 | 4 ttm,drm_kms_helper,vboxvideo |
| snd_pcm | 106496 | 2 snd_ac97_codec,snd_intel8x0 |
| 8250_fintek | 16384 | 0 |
| parport_pc | 32768 | 0 |
| parport | 49152 | 2 ppdev,parport_pc |
| snd_timer | 32768 | 1 snd_pcm |
| fb_sys_fops | 16384 | 1 drm_kms_helper |
| snd | 81920 | 4 snd_ac97_codec,snd_intel8x0,snd_timer,snd_pcm |
| syscopyarea | 16384 | 2 drm_kms_helper,vboxvideo |
| soundcore | 16384 | 1 snd |
| sysfillrect | 16384 | 2 drm_kms_helper,vboxvideo |
| sysimgblt | 16384 | 2 drm_kms_helper,vboxvideo |
| vboxguest | 286720 | 1 vboxvideo |
| i2c_piix4 | 24576 | 0 |
| mac_hid | 16384 | 0 |
| ib_iser | 49152 | 0 |
| rdma_cm | 49152 | 1 ib_iser |
| iw_cm | 45056 | 1 rdma_cm |
| ib_cm | 45056 | 1 rdma_cm |
| ib_sa | 36864 | 2 rdma_cm,ib_cm |
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| ib_core | 106496 | 6 rdma_cm,ib_cm,ib_sa,iw_cm,ib_mad,ib_iser |
| ib_addr | 16384 | 2 rdma_cm,ib_core |

--More--


```
osc@ubuntu:~$ sudo dmesg -c | tail -9
[   9.332010] floppy0: no floppy controllers found
[  35.546480] simple: module verification failed: signature and/or required key missing - tainting kernel
[  35.547010] Loading Kernel Module
[  35.547011] 11400862456688148481
[  35.547012] Hz: 250
                Jiffies: 4294901137
[ 286.239490] Removing Kernel Module
[ 286.239492] 12
[ 286.239492] 4294963810
osc@ubuntu:~$ dmesg
osc@ubuntu:~$ _
```

```
osc@ubuntu:~$ sudo rmmod simple
osc@ubuntu:~$ dmesg | tail -11
[ 6.808581] IPv6: ADDRCONF(NETDEV_CHANGE): enp0s3: link becomes ready
[ 6.893790] cgroup: new mount options do not match the existing superblock, will be ignored
[ 9.332010] floppy0: no floppy controllers found
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[ 35.547011] 11400862456688148481
[ 35.547012] Hz: 250
                Jiffies: 4294901137
[ 286.239490] Removing Kernel Module
[ 286.239492] 12
[ 286.239492] 4294963810
osc@ubuntu:~$ lsmod | head -n 4
Module                Size  Used by
ppdev                  20480  0
intel_powerclamp       16384  0
vboxvideo              53248  1
osc@ubuntu:~$
```