```
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--
```

```
osc@ubuntu:~$ cat simple.c
#include <linux/init.h>
#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);

    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_par
ser"
[    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
```

```
Module                  Size  Used by
simple                 16384  0
ppdev                  20480  0
intel_powerclamp       16384  0
vboxvideo              53248  1
ttm                    98304  1 vboxvideo
drm_kms_helper        155648  1 vboxvideo
snd_intel8x0           40960  0
snd_ac97_codec        131072  1 snd_intel8x0
input_leds             16384  0
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
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
--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
[   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:~$ lsmod | head -n 4
Module                  Size  Used by
ppdev                  20480  0
intel_powerclamp       16384  0
vboxvideo              53248  1
osc@ubuntu:~$
```

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