

1 Kmod 运行时调试图

1.1 编译安装运行调试图

1.1.1 wget 下载源码包

```
$ wget https://www.kernel.org/pub/linux/utils/kernel/kmod/kmod-11.tar.gz
--2013-06-18 01:08:47-- https://www.kernel.org/pub/linux/utils/kernel/kmod/kmod-11.tar.gz
Resolving www.kernel.org (www.kernel.org)... 149.20.4.69, 198.145.20.140
Connecting to www.kernel.org (www.kernel.org)|149.20.4.69|:
443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3458574 (3.3M) [application/x-gzip]
Saving to: `kmod-11.tar.gz'

100%[=====>] 3,458,574 795K/s
in 5.3s

2013-06-18 01:08:54 (641 KB/s) - `kmod-11.tar.gz' saved [3458574/3458574]
```

1.1.2 tar 解压源码包

```
$ tar xzf kmod-11.tar.gz
$ cd kmod-11
$ ls
aclocal.m4  configure  libkmod    Makefile.in  README  tools
build-aux  configure.ac  m4        man          testsuite
config.h.in  COPYING    Makefile.am  NEWS        TODO
$
```

1.1.3 configure 配置项目源码

```
Terminal
$ wget https://www.kernel.org/pub/linux/utils/kernel/kmod/kmod-11.tar.gz
--2013-06-22 08:58:01-- https://www.kernel.org/pub/linux/utils/kernel/kmod/kmod-11.tar.gz
Resolving www.kernel.org (www.kernel.org)... 149.20.4.69, 198.145.20.140
Connecting to www.kernel.org (www.kernel.org)|149.20.4.69|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3458574 (3.3M) [application/x-gzip]
Saving to: `kmod-11.tar.gz'

100%[=====>] 3,458,574    540K/s   in 9.0s

2013-06-22 08:58:11 (375 KB/s) - `kmod-11.tar.gz' saved [3458574/3458574]

$
```

Figure 1: wget 下载源码包

```
Terminal
$ tar xzf kmod-11.tar.gz
$ cd kmod-11
$ ls
aclocal.m4  configure  libkmod    Makefile.in  README     tools
build-aux  configure.ac  m4        man          testsuite
config.h.in  COPYING    Makefile.am  NEWS        TODO
$
```

Figure 2: tar 解压源码包

```

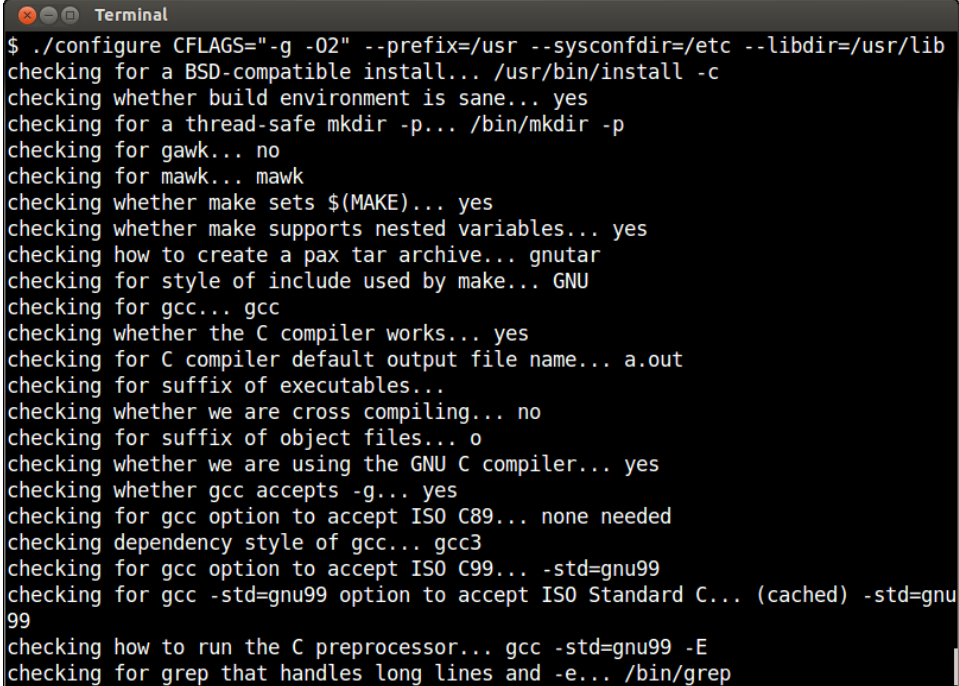
$ ./configure CFLAGS="-g -O2" --prefix=/usr --sysconfdir=/etc --
libdir=/usr/lib
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for a thread-safe mkdir -p... /bin/mkdir -p
checking for gawk... no
checking for mawk... mawk
checking whether make sets $(MAKE)... yes
checking whether make supports nested variables... yes
checking how to create a pax tar archive... gnutar
checking for style of include used by make... GNU
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g... yes
checking for gcc option to accept ISO C89... none needed
checking dependency style of gcc... gcc3
...
kmod 11
=====

prefix:          /usr
sysconfdir:      /etc
libdir:          /usr/lib
rootlibdir:      /usr/lib
includedir:      ${prefix}/include
bindir:          ${exec_prefix}/bin

compiler:        gcc -std=gnu99
cflags:          -pipe -DANOTHER_BRICK_IN_THE -
Wall -W -Wextra -Wno-inline -Wvla -Wundef -Wformat=2 -
Wlogical-op -Wsign-compare -Wformat-security -Wmissing-include-
dirs -Wformat-nonliteral -Wold-style-definition -Wpointer-
arith -Winit-self -Wdeclaration-after-statement -Wfloat-
equal -Wmissing-prototypes -Wstrict-prototypes -Wredundant-
decls -Wmissing-declarations -Wmissing-noreturn -Wshadow -
Wendif-labels -Wstrict-aliasing=2 -Wwrite-strings -Wno-
long-long -Wno-overlength-strings -Wno-unused-parameter -

```

```
Wno-missing-field-initializers -Wno-unused-result -Wnested-  
externs -Wchar-subscripts -Wtype-limits -Wuninitialized -  
fno-common -fdiagnostics-show-option -fvisibility=hidden -  
ffunction-sections -fdata-sections -g -O2  
ldflags:          -Wl,--as-needed -Wl,--gc-sections  
  
tools:            yes  
logging:          yes  
compression:      xz=no  zlib=no  
debug:            no  
doc:              no  
man:              yes
```



```
Terminal  
$ ./configure CFLAGS="-g -O2" --prefix=/usr --sysconfdir=/etc --libdir=/usr/lib  
checking for a BSD-compatible install... /usr/bin/install -c  
checking whether build environment is sane... yes  
checking for a thread-safe mkdir -p... /bin/mkdir -p  
checking for gawk... no  
checking for mawk... mawk  
checking whether make sets $(MAKE)... yes  
checking whether make supports nested variables... yes  
checking how to create a pax tar archive... gnutar  
checking for style of include used by make... GNU  
checking for gcc... gcc  
checking whether the C compiler works... yes  
checking for C compiler default output file name... a.out  
checking for suffix of executables...  
checking whether we are cross compiling... no  
checking for suffix of object files... o  
checking whether we are using the GNU C compiler... yes  
checking whether gcc accepts -g... yes  
checking for gcc option to accept ISO C89... none needed  
checking dependency style of gcc... gcc3  
checking for gcc option to accept ISO C99... -std=gnu99  
checking for gcc -std=gnu99 option to accept ISO Standard C... (cached) -std=gnu99  
checking how to run the C preprocessor... gcc -std=gnu99 -E  
checking for grep that handles long lines and -e... /bin/grep
```

Figure 3: configure 配置源码包

1.1.4 编译项目源码

```
$ make
```

```
make --no-print-directory all-recursive
Making all in .
  CC      libkmod/libkmod.lo
  CC      libkmod/libkmod-list.lo
  CC      libkmod/libkmod-config.lo
  CC      libkmod/libkmod-index.lo
  CC      libkmod/libkmod-module.lo
  CC      libkmod/libkmod-file.lo
  CC      libkmod/libkmod-elf.lo
  CC      libkmod/libkmod-hash.lo
  CC      libkmod/libkmod-array.lo
  CC      libkmod/libkmod-util.lo
  CCLD    libkmod/libkmod-util.la
  CCLD    libkmod/libkmod.la
  CCLD    libkmod/libkmod-private.la
  CC      tools/kmod.o
  CC      tools/lsmmod.o
  CC      tools/rmmmod.o
  CC      tools/insmod.o
  CC      tools/modinfo.o
  CC      tools/modprobe.o
  CC      tools/depmod.o
  CC      tools/log.o
  CCLD    tools/kmod
  CCLD    tools/kmod-nolib
  GEN     tools/insmod
  GEN     tools/rmmmod
  GEN     tools/lsmmod
  GEN     tools/modprobe
  GEN     tools/modinfo
  GEN     tools/depmod
  GEN     libkmod/libkmod.pc
Making all in libkmod/docs
make[2]: Nothing to be done for `all'.
Making all in man
make[2]: Nothing to be done for `all'.
```

1.1.5 测试生成命令

```
$ ./tools/insmod -h
```

```
Terminal
$ make
make --no-print-directory all-recursive
Making all in .
CC      libkmod/libkmod.lo
CC      libkmod/libkmod-list.lo
CC      libkmod/libkmod-config.lo
CC      libkmod/libkmod-index.lo
CC      libkmod/libkmod-module.lo
CC      libkmod/libkmod-file.lo
CC      libkmod/libkmod-elf.lo
CC      libkmod/libkmod-hash.lo
CC      libkmod/libkmod-array.lo
CC      libkmod/libkmod-util.lo
CCLD    libkmod/libkmod-util.la
CCLD    libkmod/libkmod.la
CCLD    libkmod/libkmod-private.la
CC      tools/kmod.o
CC      tools/lsmmod.o
CC      tools/rmmod.o
CC      tools/insmod.o
CC      tools/modinfo.o
CC      tools/modprobe.o
CC      tools/depmod.o
CC      tools/log.o
CCLD    tools/kmod
```

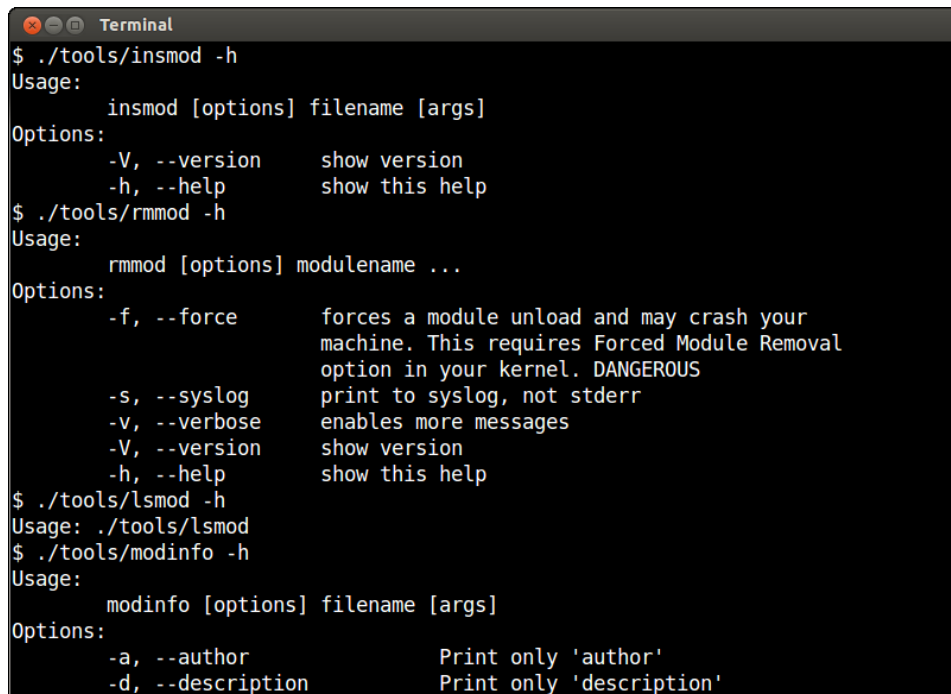
Figure 4: make 编译源码包

```
Usage:
  insmod [options] filename [args]
Options:
  -V, --version      show version
  -h, --help         show this help
$ ./tools/rmmod -h
Usage:
  rmmod [options] modulename ...
Options:
  -f, --force        forces a module unload and may crash your
                    machine. This requires Forced Module Removal
                    option in your kernel. DANGEROUS
  -s, --syslog       print to syslog, not stderr
  -v, --verbose      enables more messages
  -V, --version      show version
  -h, --help         show this help
$ ./tools/lsmmod -h
Usage: ./tools/lsmmod
$ ./tools/modinfo -h
Usage:
```

```

modinfo [options] filename [args]
Options:
  -a, --author           Print only 'author'
  -d, --description      Print only 'description'
  -l, --license          Print only 'license'
  -p, --parameters       Print only 'parm'
  -n, --filename         Print only 'filename'
  -O, --null              Use \0 instead of \n
  -F, --field=FIELD      Print only provided FIELD
  -k, --set-version=VERSION Use VERSION instead of `uname -r`
  -b, --basedir=DIR      Use DIR as filesystem root for /lib/modules
  -V, --version           Show version
  -h, --help             Show this help
$

```



```

Terminal
$ ./tools/insmod -h
Usage:
insmod [options] filename [args]
Options:
  -V, --version      show version
  -h, --help         show this help
$ ./tools/rmmod -h
Usage:
rmmod [options] modulename ...
Options:
  -f, --force        forces a module unload and may crash your
                     machine. This requires Forced Module Removal
                     option in your kernel. DANGEROUS
  -s, --syslog       print to syslog, not stderr
  -v, --verbose       enables more messages
  -V, --version       show version
  -h, --help         show this help
$ ./tools/lsmod -h
Usage: ./tools/lsmod
$ ./tools/modinfo -h
Usage:
modinfo [options] filename [args]
Options:
  -a, --author           Print only 'author'
  -d, --description      Print only 'description'

```

Figure 5: 测试生成命令

1.2 项目 Debug 版运行调试图

1.3 源码修改运行调试图