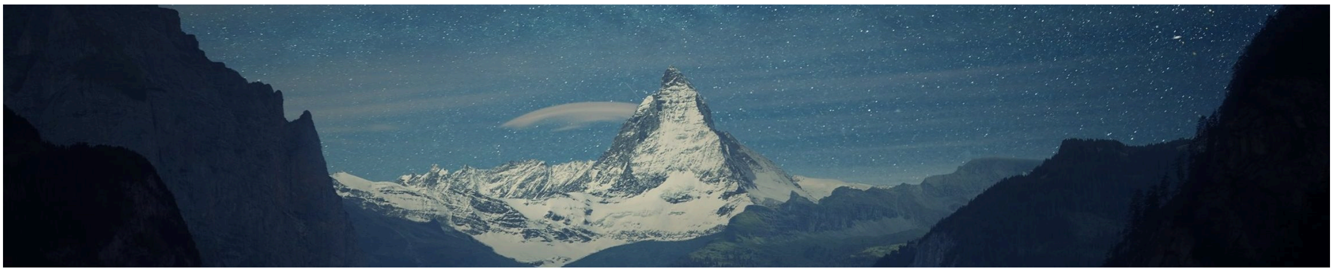
SillyRabbit's blog

路虽远行则将至，事虽难做则必成！



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Patchelf和glibc-all-in_one使用笔记

2021年7月22日 作者 SillyRabbit

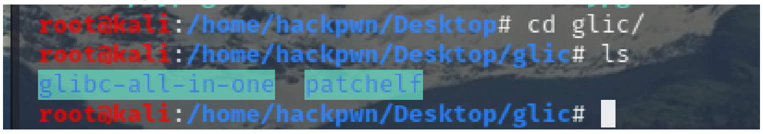
这个用来让程序链接指定的glibc，调试必备的。

先下载两个工具：

```
#Patchelf
git clone https://github.com/NixOS/patchelf

#glibc-all-in_one
git clone https://github.com/matrix1001/glibc-all-in-one
```

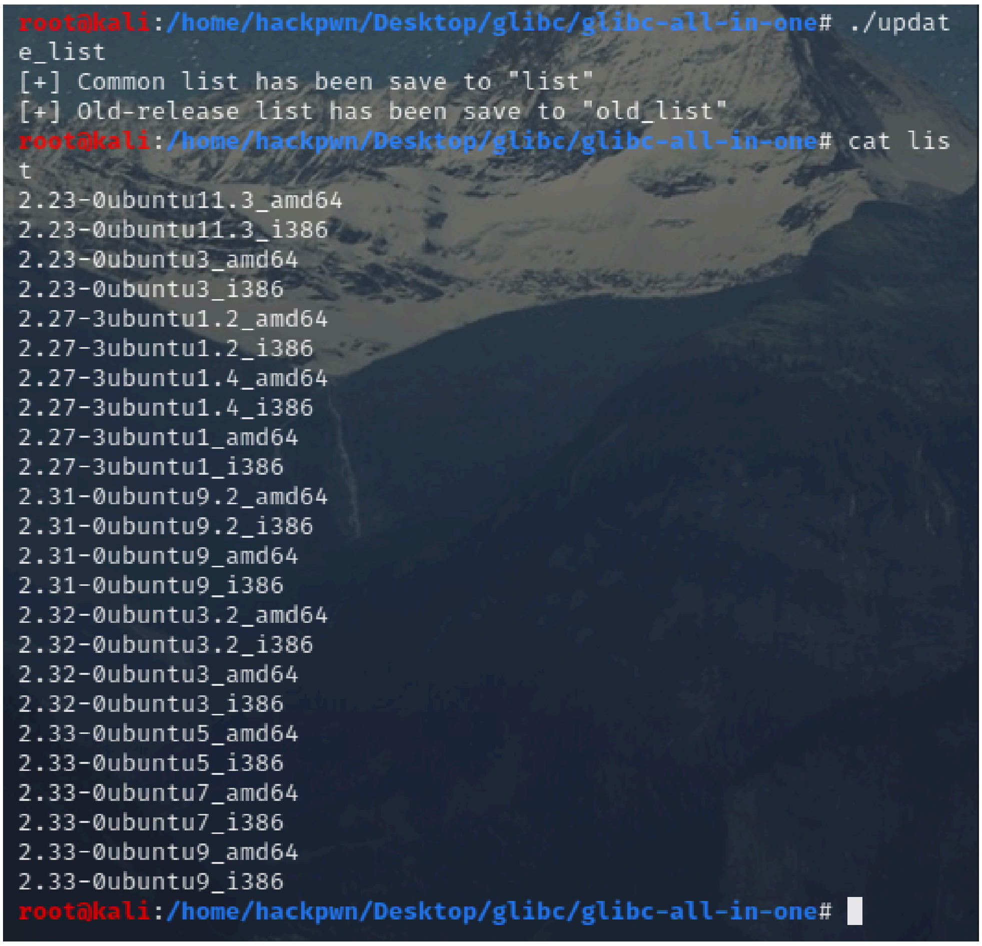
我创建了glibc目录，把两个工具放在里面



```
root@kali:/home/hackpwn/Desktop# cd glic/
root@kali:/home/hackpwn/Desktop/glic# ls
glibc-all-in-one  patchelf
root@kali:/home/hackpwn/Desktop/glic# 
```

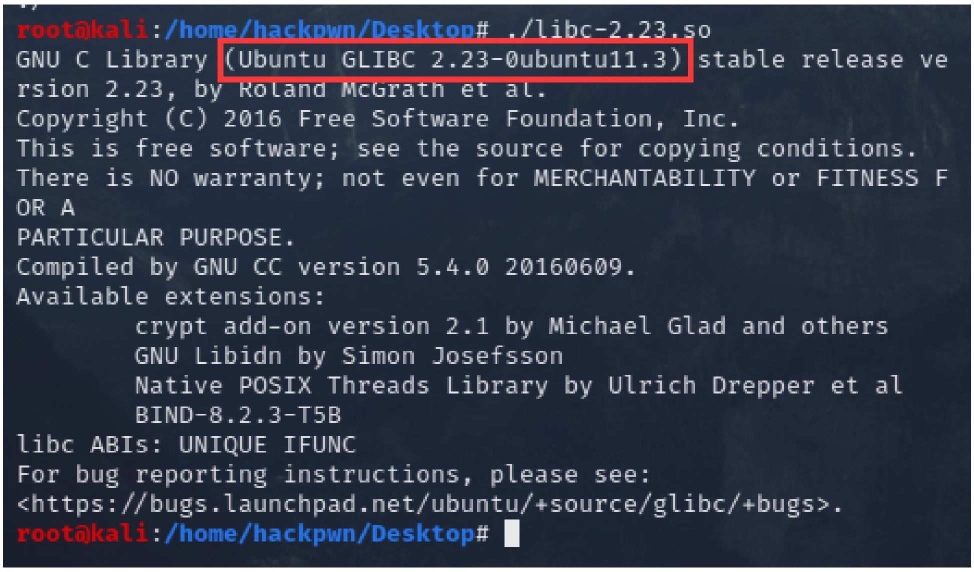
首先：

```
./update_list             #更新最新版本的glibc
cat list                 #查看可下载的glibc
```



```
root@kali:/home/hackpwn/Desktop/glibc/glibc-all-in-one# ./updat
e_list
[+] Common list has been save to "list"
[+] Old-release list has been save to "old_list"
root@kali:/home/hackpwn/Desktop/glibc/glibc-all-in-one# cat lis
t
2.23-0ubuntu11.3_amd64
2.23-0ubuntu11.3_i386
2.23-0ubuntu3_amd64
2.23-0ubuntu3_i386
2.27-3ubuntu1.2_amd64
2.27-3ubuntu1.2_i386
2.27-3ubuntu1.4_amd64
2.27-3ubuntu1.4_i386
2.27-3ubuntu1_amd64
2.27-3ubuntu1_i386
2.31-0ubuntu9.2_amd64
2.31-0ubuntu9.2_i386
2.31-0ubuntu9_amd64
2.31-0ubuntu9_i386
2.32-0ubuntu3.2_amd64
2.32-0ubuntu3.2_i386
2.32-0ubuntu3_amd64
2.32-0ubuntu3_i386
2.33-0ubuntu5_amd64
2.33-0ubuntu5_i386
2.33-0ubuntu7_amd64
2.33-0ubuntu7_i386
2.33-0ubuntu9_amd64
2.33-0ubuntu9_i386
root@kali:/home/hackpwn/Desktop/glibc/glibc-all-in-one# 
```

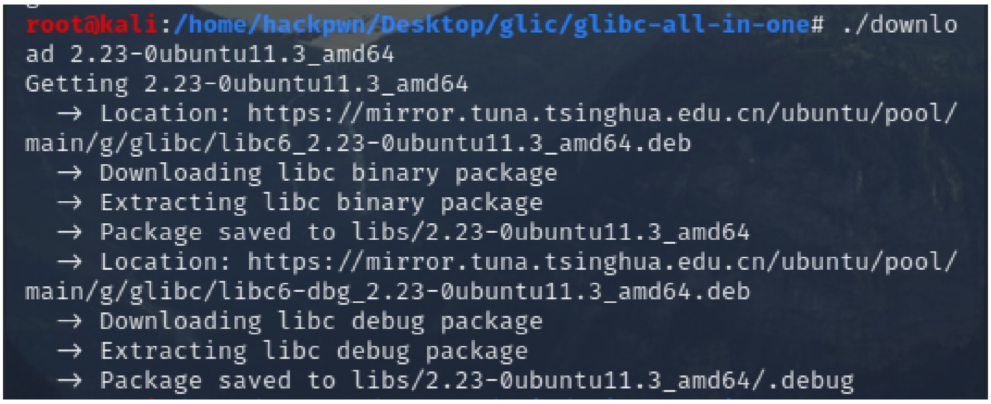
再根据题目所给的 libc， 找对应版本的连接器



```
root@kali:/home/hackpwn/Desktop# ./libc-2.23.so
GNU C Library (Ubuntu GLIBC 2.23-0ubuntu11.3) stable release ve
rsion 2.23, by Roland McGrath et al.
Copyright (C) 2016 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.
There is NO warranty; not even for MERCHANTABILITY or FITNESS F
OR A
PARTICULAR PURPOSE.
Compiled by GNU CC version 5.4.0 20160609.
Available extensions:
        crypt add-on version 2.1 by Michael Glad and others
        GNU Libidn by Simon Josefsson
        Native POSIX Threads Library by Ulrich Drepper et al
        BIND-8.2.3-T5B
libc ABIs: UNIQUE IFUNC
For bug reporting instructions, please see:
<https://bugs.launchpad.net/ubuntu/+source/glibc/+bugs>.
root@kali:/home/hackpwn/Desktop# 
```

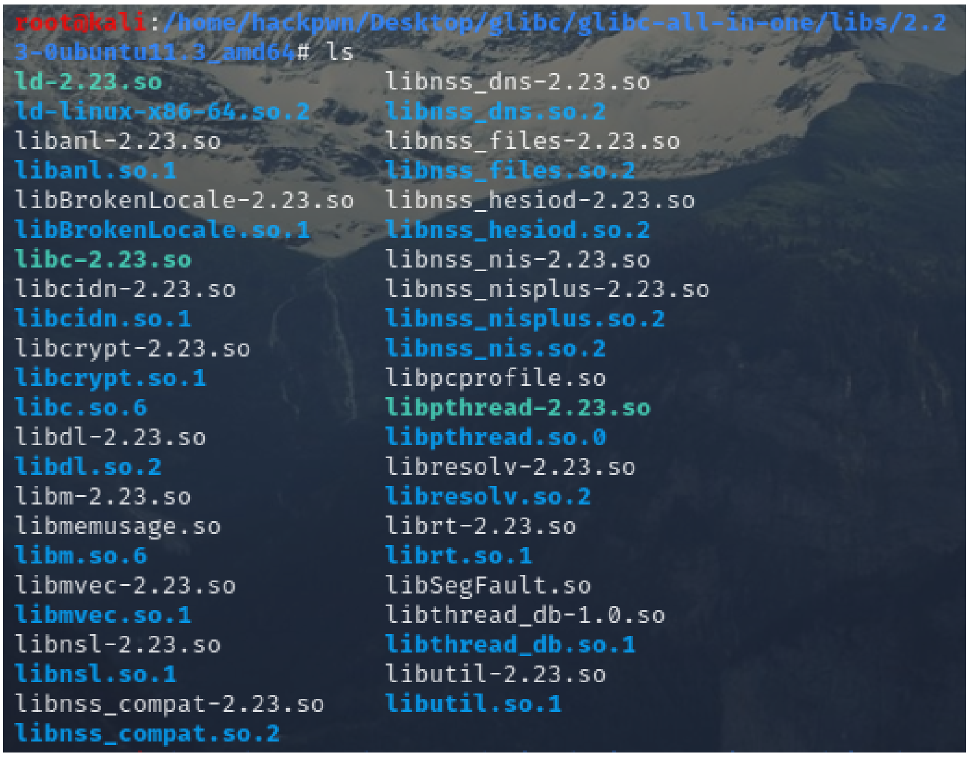
下载该连接器：

```
./download 2.23-0ubuntu11.3
```



```
root@kali:/home/hackpwn/Desktop/glic/glibc-all-in-one# ./downlo
ad 2.23-0ubuntu11.3_amd64
Getting 2.23-0ubuntu11.3_amd64
  -> Location: https://mirror.tuna.tsinghua.edu.cn/ubuntu/pool/
main/g/glibc/libc6_2.23-0ubuntu11.3_amd64.deb
  -> Downloading libc binary package
  -> Extracting libc binary package
  -> Package saved to libs/2.23-0ubuntu11.3_amd64
  -> Location: https://mirror.tuna.tsinghua.edu.cn/ubuntu/pool/
main/g/glibc/libc6-dbg_2.23-0ubuntu11.3_amd64.deb
  -> Downloading libc debug package
  -> Extracting libc debug package
  -> Package saved to libs/2.23-0ubuntu11.3_amd64/.debug
```

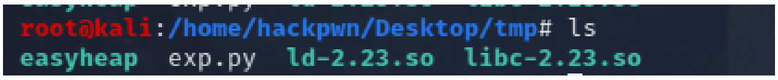
下载好的libc就在libs目录下



```
root@kali:/home/hackpwn/Desktop/glibc/glibc-all-in-one/libs/2.2
3-0ubuntu11.3_amd64# ls
ld-2.23.so               libnss_dns-2.23.so
ld-linux-x86-64.so.2     libnss_dns.so.2
libanl-2.23.so           libnss_files-2.23.so
libanl.so.1              libnss_files.so.2
libBrokenLocale-2.23.so  libnss_hesiod-2.23.so
libBrokenLocale.so.1     libnss_hesiod.so.2
libc-2.23.so             libnss_nis-2.23.so
libcidn-2.23.so          libnss_nisplus-2.23.so
libcidn.so.1             libnss_nisplus.so.2
libcrypt-2.23.so         libnss_nis.so.2
libcrypt.so.1            libpcprofile.so
libc.so.6                libpthread-2.23.so
libdl-2.23.so            libpthread.so.0
libdl.so.2               libresolv-2.23.so
libm-2.23.so             libresolv.so.2
libmemusage.so           librt-2.23.so
libm.so.6                librt.so.1
libmvec-2.23.so          libSegFault.so
libmvec.so.1             libthread_db-1.0.so
libnsl-2.23.so           libthread_db.so.1
libnsl.so.1              libutil-2.23.so
libnss_compat-2.23.so    libutil.so.1
libnss_compat.so.2
```

然后把ld文件和libc复制到pwn题目录下

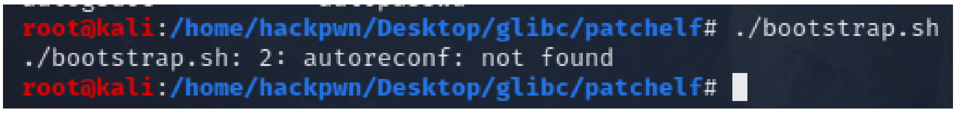
```
cp ./ld-2.23.so ../../../../tmp/
cp ./libc-2.23.so ../../../../tmp/
```



```
root@kali:/home/hackpwn/Desktop/tmp# ls
easyheap  exp.py  ld-2.23.so  libc-2.23.so
```

接下来使用Patchelf

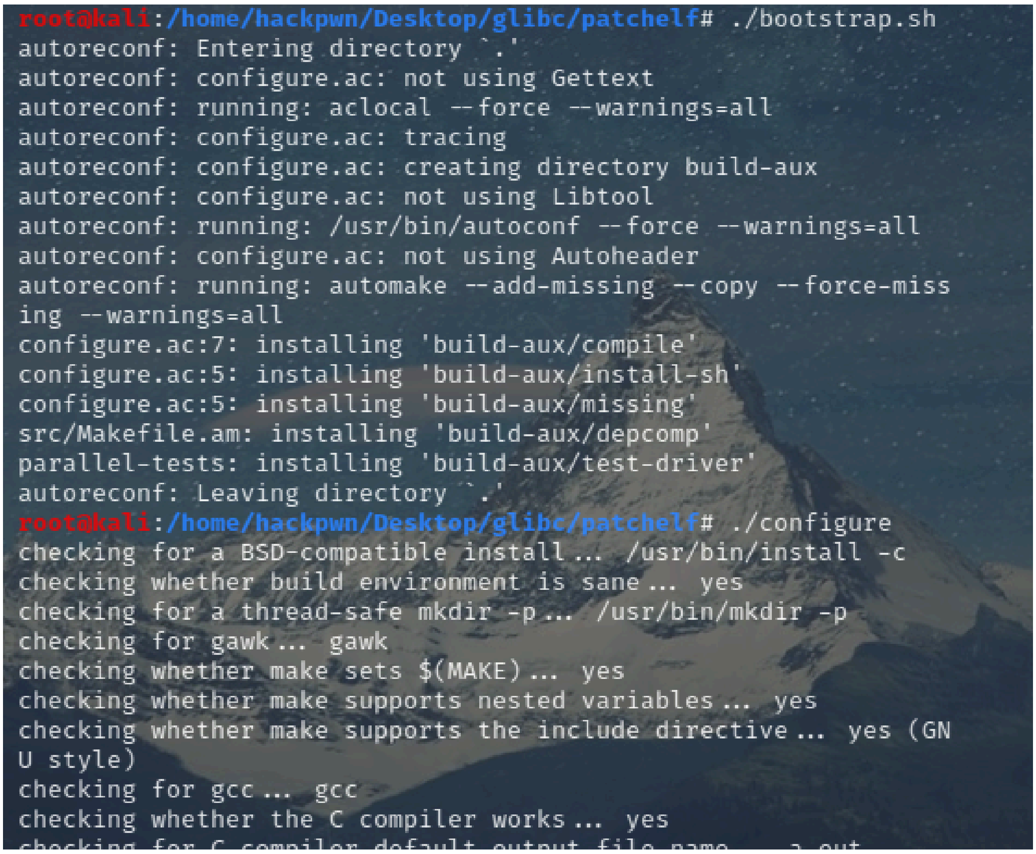
```
./bootstrap.sh
./configure
make
sudo make install
make check
```



```
root@kali:/home/hackpwn/Desktop/glibc/patchelf# ./bootstrap.sh
./bootstrap.sh: 2: autoreconf: not found
root@kali:/home/hackpwn/Desktop/glibc/patchelf# 
```

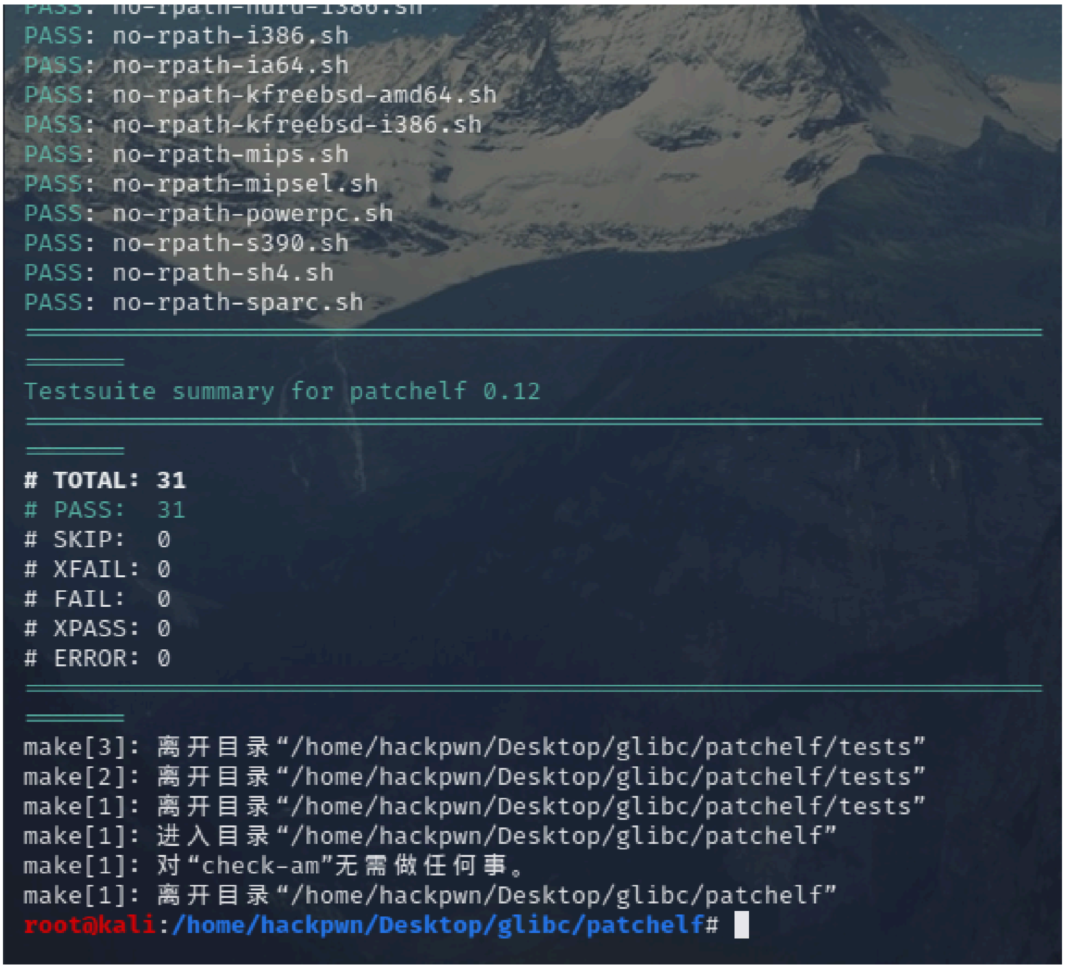
缺了autoreconf

```
apt-get install autoconf automake libtool
```



```
root@kali:/home/hackpwn/Desktop/glibc/patchelf# ./bootstrap.sh
autoreconf: Entering directory `.'
autoreconf: configure.ac: not using Gettext
autoreconf: running: aclocal --force --warnings=all
autoreconf: configure.ac: tracing
autoreconf: configure.ac: creating directory build-aux
autoreconf: configure.ac: not using Libtool
autoreconf: running: /usr/bin/autoconf --force --warnings=all
autoreconf: configure.ac: not using Autoheader
autoreconf: running: automake --add-missing --copy --force-miss
ing --warnings=all
configure.ac:7: installing 'build-aux/compile'
configure.ac:5: installing 'build-aux/install-sh'
configure.ac:5: installing 'build-aux/missing'
src/Makefile.am: installing 'build-aux/depcomp'
parallel-tests: installing 'build-aux/test-driver'
autoreconf: Leaving directory `.'
root@kali:/home/hackpwn/Desktop/glibc/patchelf# ./configure
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for a thread-safe mkdir -p... /usr/bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
checking whether make supports nested variables... yes
checking whether make supports the include directive... yes (GN
U style)
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
```

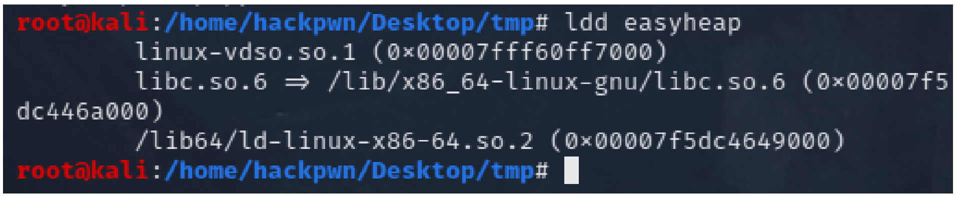
完成



```
PASS: no-rpath-hurd-i386.sh
PASS: no-rpath-i386.sh
PASS: no-rpath-ia64.sh
PASS: no-rpath-kfreebsd-amd64.sh
PASS: no-rpath-kfreebsd-i386.sh
PASS: no-rpath-mips.sh
PASS: no-rpath-mipsel.sh
PASS: no-rpath-powerpc.sh
PASS: no-rpath-s390.sh
PASS: no-rpath-sh4.sh
PASS: no-rpath-sparc.sh
============================================================================
Testsuite summary for patchelf 0.12
============================================================================
# TOTAL: 31
# PASS:  31
# SKIP:  0
# XFAIL: 0
# FAIL:  0
# XPASS: 0
# ERROR: 0
============================================================================
make[3]: 离开目录“/home/hackpwn/Desktop/glibc/patchelf/tests”
make[2]: 离开目录“/home/hackpwn/Desktop/glibc/patchelf/tests”
make[1]: 离开目录“/home/hackpwn/Desktop/glibc/patchelf/tests”
make[1]: 进入目录“/home/hackpwn/Desktop/glibc/patchelf”
make[1]: 对“check-am”无需做任何事。
make[1]: 离开目录“/home/hackpwn/Desktop/glibc/patchelf”
root@kali:/home/hackpwn/Desktop/glibc/patchelf# 
```

查看题目原来的 libc 和 ld

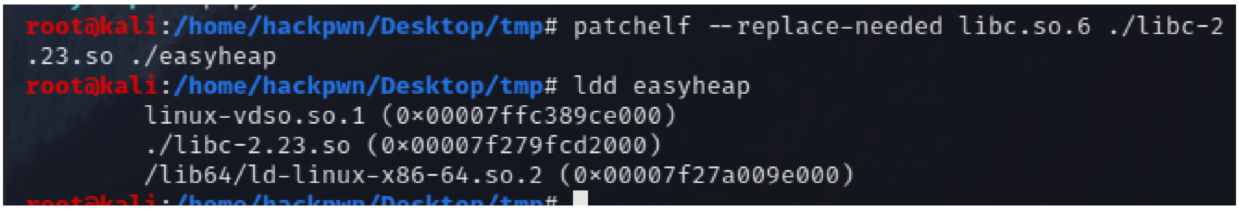
```
ldd easyheap
```



```
root@kali:/home/hackpwn/Desktop/tmp# ldd easyheap
        linux-vdso.so.1 (0x00007fff60ff7000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f5
dc446a000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f5dc4649000)
root@kali:/home/hackpwn/Desktop/tmp# 
```

替换libc

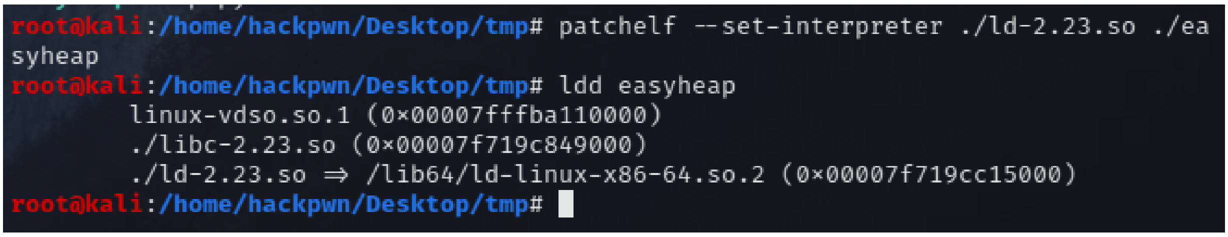
```
patchelf --replace-needed libc.so.6 ./libc-2.23.so ./easyheap
```



```
root@kali:/home/hackpwn/Desktop/tmp# patchelf --replace-needed libc.so.6 ./libc-2
.23.so ./easyheap
root@kali:/home/hackpwn/Desktop/tmp# ldd easyheap
        linux-vdso.so.1 (0x00007ffc389ce000)
        ./libc-2.23.so (0x00007f279fcd2000)
        /lib64/ld-linux-x86-64.so.2 (0x00007f27a009e000)
root@kali:/home/hackpwn/Desktop/tmp# 
```

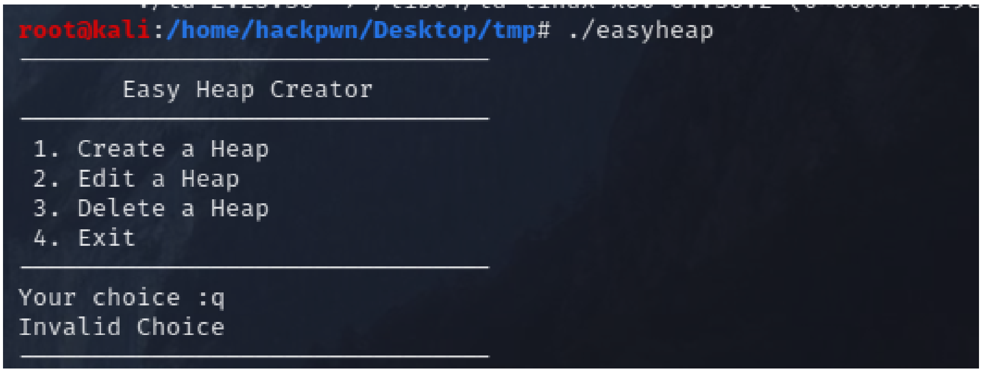
设置ld文件

```
patchelf --set-interpreter ./ld-2.23.so ./easyheap
```



```
root@kali:/home/hackpwn/Desktop/tmp# patchelf --set-interpreter ./ld-2.23.so ./ea
syheap
root@kali:/home/hackpwn/Desktop/tmp# ldd easyheap
        linux-vdso.so.1 (0x00007fffba110000)
        ./libc-2.23.so (0x00007f719c849000)
        ./ld-2.23.so => /lib64/ld-linux-x86-64.so.2 (0x00007f719cc15000)
root@kali:/home/hackpwn/Desktop/tmp# 
```

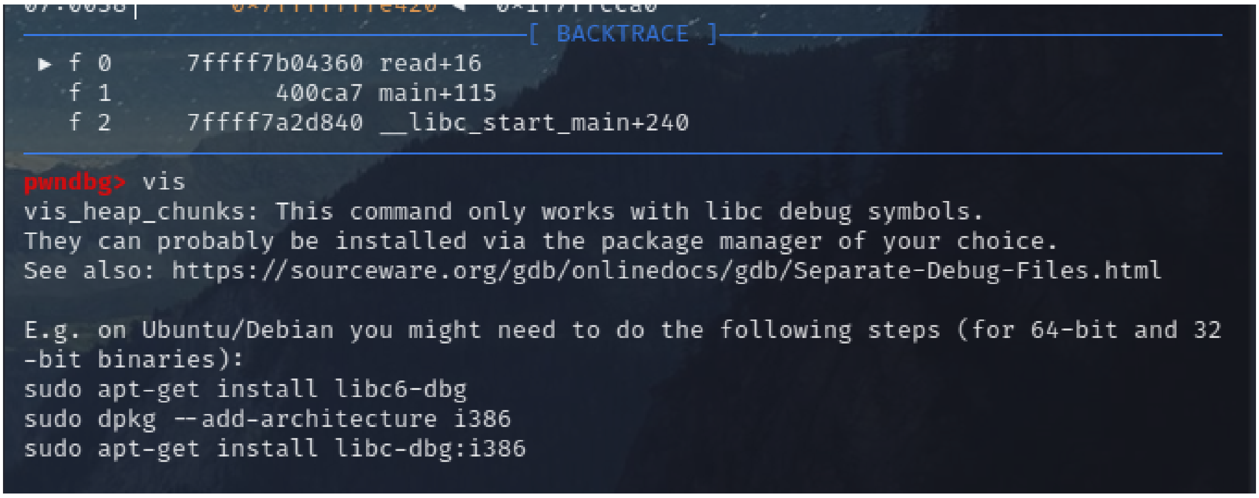
正常执行



```
root@kali:/home/hackpwn/Desktop/tmp# ./easyheap
--------------------------------
       Easy Heap Creator
--------------------------------
 1. Create a Heap
 2. Edit a Heap
 3. Delete a Heap
 4. Exit
--------------------------------
Your choice :q
Invalid Choice
--------------------------------
```

gdb调试

直接整会出问题



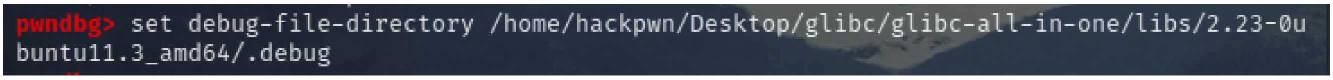
```
──────────────────────────────────────[ BACKTRACE ]──────────────────────────────────────
 ► f 0     7ffff7b04360 read+16
   f 1           400ca7 main+115
   f 2     7ffff7a2d840 __libc_start_main+240
─────────────────────────────────────────────────────────────────────────────────────────
pwndbg> vis
vis_heap_chunks: This command only works with libc debug symbols.
They can probably be installed via the package manager of your choice.
See also: https://sourceware.org/gdb/onlinedocs/gdb/Separate-Debug-Files.html

E.g. on Ubuntu/Debian you might need to do the following steps (for 64-bit and 32
-bit binaries):
sudo apt-get install libc6-dbg
sudo dpkg --add-architecture i386
sudo apt-get install libc-dbg:i386
```

有设置一下符号表和将.debug，移动到题目的同级目录下两个办法

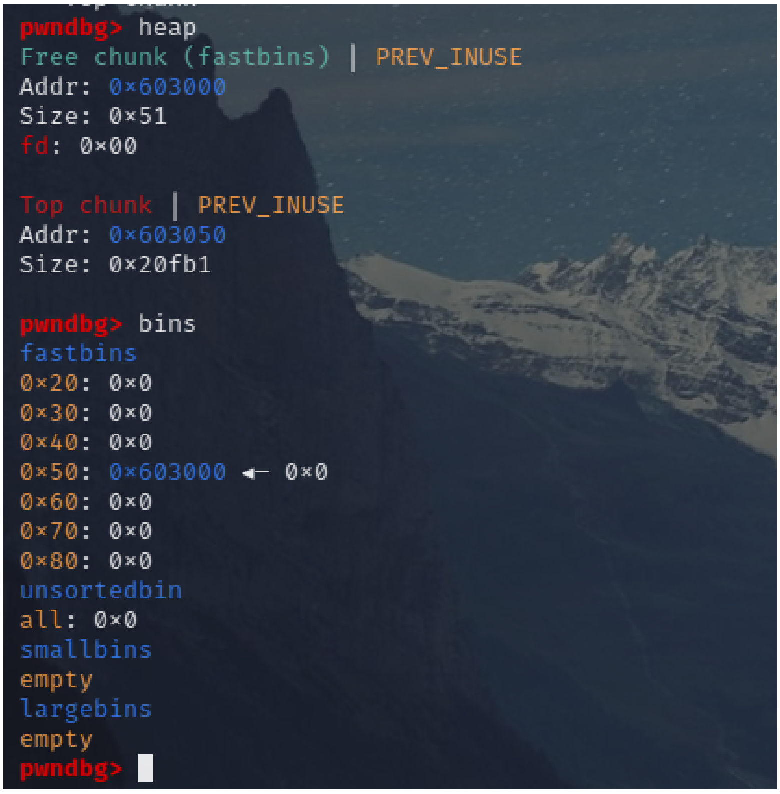
```
set debug-file-directory /home/hackpwn/Desktop/glibc/glibc-all-in-one/libs/2.23-0ubu
```

在gdb里面设置调试符号表，路径在libs里面



```
pwndbg> set debug-file-directory /home/hackpwn/Desktop/glibc/glibc-all-in-one/libs/2.23-0u
buntu11.3_amd64/.debug
```

heap，bins，vis等正常执行



```
pwndbg> heap
Free chunk (fastbins) | PREV_INUSE
Addr: 0x603000
Size: 0x51
fd: 0x00

Top chunk | PREV_INUSE
Addr: 0x603050
Size: 0x20fb1

pwndbg> bins
fastbins
0x20: 0x0
0x30: 0x0
0x40: 0x0
0x50: 0x603000 ◂— 0x0
0x60: 0x0
0x70: 0x0
0x80: 0x0
unsortedbin
all: 0x0
smallbins
empty
largebins
empty
pwndbg> 
```

pwntools中gdb调试

只能是将.debug，移动到题目的同级目录下

```
mkdir .debug
cp /home/hackpwn/Desktop/.../.debug/* ./
```

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