Binutil (1A)

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Binary Utilities

- addr2line convert addresses into file names and line numbers
- ar create, modify, and extract from archives
- as the portable GNU assembler
- gprof display call graph profile data
- ld The GNU linker
- nm list symbols from object files
- objcopy copy and translate object files
- objdump display information from object files
- ranlib generate index to archive
- readelf Displays information about ELF files
- size list section sizes and total size
- strip Discard symbols from object files

as options

- -Wa,[as options]
  - -al
  - -as
  - -l[pass]
  - -W, --no-warn
  - -march=[arch string]

collect2 options (1)

- -L[library directory]
- -l[library name]
- -shared
- -static
- -nostdlib
- -nostartfiles

collect2 options (2)

- -W,[link options]
  - -s
  - -x
  - -n
  - -r
  - -e [name]
  - -oformat [format]

objdump

objdump [-a | --archive-headers]
[-b bfdname | --target=bfdname]
[-d | --disassemble] [-D | --disassemble-all]
[-f | --file-headers]
[-h | --section-headers | --headers] [-i | --info]
[-j section | --section=section]
[-l | --line-numbers]
[-m machine | --architecture=machine]
[-r | --reloc] [-R | --dynamic-reloc]
[-s | --full-contents] [--stabs]
[-t | --syms] [-T | --dynamic-syms] [-x | --all-headers]
[--version] [--help] objfile...

objdump displays information about one or more object files. The options control what particular information to display. This information is mostly useful to programmers who are working on the compilation tools, as opposed to programmers who just want their program to compile and work.

objfile... are the object files to be examined. When you specify archives, objdump shows information on each of the member object files.

The long and short forms of options, shown here as alternatives, are equivalent. At least one option besides `-l' must be given.

-g

-g Produce debugging information in the operating system's native
format (stabs, COFF, XCOFF, or DWARF 2). GDB can work with this
debugging information.

-g

-v Verbose mode. Print out GNU CPP's version number at the beginning
    of execution, and report the final form of the include path.

addr2line

addr2line -fe t 0x80484a0

-f	display function names as well as file and line number
-e filename	Specify the name of the executable. The default file is a.out.

profile

gcc -pg -o t t.c ➡ gmon.out

gprof -A ./t

-A[symspec]
The -A option causes "gprof" to print annotated source code.
If symspec is specified, print output only for matching symbols.

Nm (1)

-a Display all symbols
-D Display the dynamic symbols
-g Display only external symbols.
-v Show the version number of nm and exit
-s include the index
-u Display only undefined symbols

Nm (2)

"A" absolute
"B" the uninitialized data section (known as BSS)
"C" Common symbols are uninitialized data
"D" the initialized data section
"G" a global int variable
"i" an indirect function
"N" a debugging symbol
"R" a read only data section
"S" an uninitialized data section for small objects
"T" the text (code) section
"U" The symbol is undefined
"V" a weak object
"W" a weak symbol
"-" a stabs symbol in an a.out object file
"?" unknown

objcopy

objcopy t t.new	
objcopy -o binary t t.new	No elf header, only data & instruction
objcopy -R note -R .comment t t.new	Remove .note & .comment section
objcopy -S t t.new	Remove symbols & relocation info

Objdump

objdump -d t.o — disassemble

objdump -S t.o — gcc -g -c t.c

Disassemble with C code

-a : display archive header information
-x : display all available header information
-t : display the symbol table entries
-T : display the dynamic symbol table entries
-r : display the relocation table entries
-R : display the dynamic relocation table entries

strip

strip -R .note -R .comment -s t

-R sectionname : remove the section
-s : remove all symbols

References

[1] An Introduction to GCC, B. Gough, http://www.network-theory.co.uk/docs/gccintro/
[2] Unix, Linux Programming Indispensable Utilities, CW Paik