
Linker options

Like the assembler, the linker seldom sees the light of day: you normally start both programs via the C compiler control program *cc*. As with the assembler, this gives rise to a surprising diversity of options. The following list compares the linker options for the GNU linkers (two of them, with conflicting options), SCO UNIX, Solaris 2, SunOS 4, System V.3, System V.4, and SCO XENIX. Currently available BSD systems use one of the GNU linkers: for example, BSD/386 up to version 1.1 uses the old linker, and BSD/OS 2.0 uses the new linker. The Solaris 2 linker is basically the System V.4 linker, but it has a few extra flags. Unless otherwise noted, all SVR4 options also apply to Solaris 2.

-Aarchitecture (GNU)

For the Intel 960 family only: *architecture* is a two-letter abbreviation specifying a member of the processor family.

-A file (old GNU)

Don't incorporate the text and data from *file* into the output file, just use the symbols. This can be used to implement crude dynamic loading.

-A file (SunOS 4)

Perform an incremental load: the resultant output file is to be read in to a process executing from the program *file*, which will be used to resolve symbolic references.

-A address (XENIX)

Produce a standalone program to be loaded at *address*.

-a (SCO, SVR3, SVR4)

Produce an executable file. This is the default behaviour, and is the opposite of the *-r* option.

-align datum (SunOS 4)

Force *datum* to be page-aligned. This is typically used for FORTRAN common blocks.

-assert assertion (SunOS 4)

Check an assertion. If the assertion fails, print a diagnostic and abort the link.

-Bbinding (SunOS 4, Solaris 2)

Specify the kind of binding to perform. *binding* may be *dynamic* (perform dynamic binding at run time), *nosymbolic* (do not perform symbolic relocation), *static* (perform static

binding at link time), or `symbolic` (force symbolic relocation). Solaris 2 does not support the keyword `nosymbolic`.

- Bstatic (SunOS 4, GNU)
Specify static libraries only. GNU `ld` accepts this option, but ignores it.
- B *number* (XENIX)
Set the text selector bias to *number*
- b (SVR4)
When performing dynamic linking, do not perform special processing for relocations to symbols in shared objects.
- b *format* (new GNU)
Specify the binary format of the files whose names follow. This is only needed when linking files with multiple formats.
- C (XENIX)
Ignore the case of the symbols.
- c *file* (new GNU)
Read commands from *file*. These commands override the standard link format.
- c *x* (XENIX)
Specify the target CPU type 80x86. *x* defaults to 3.
- D *size* (old GNU, SunOS 4)
Pad the data segment to *size*. The padding may overlap with the bss segment. The SunOS 4 linker interprets *size* in hexadecimal.
- D *number* (XENIX)
Set the data selector bias to *number*.
- dyn (SVR4)
Specify dynamic (*yn* is *y*) or static (*yn* is *n*) linking.
- d (GNU, SunOS 4)
When creating a relocatable output file with the `-r` option, convert “common” symbols to bss.
- dc (SunOS 4)
Perform the `-d` option, but also copy initialized data referenced by this program from shared objects.
- dp (SunOS 4)
Force an alias definition of undefined procedure entry points. Used with dynamic binding.
- defsym *symbol* = *expression* (new GNU)
Create the global symbol *symbol* in the output file and assign the value *expression* to it.
- e *symbol* (all)
Set the entry address in the output file to *symbol*.

- Fformat** (new GNU)
This is an obsolete option which some older linkers used to specify object file formats. GNU *ld* accepts it, but ignores it.
- F name** (Solaris 2)
Used when building shared objects. The symbol table of the shared object being built is used as a “filter” on the symbol table of the shared object *name*.
- F size** (XENIX)
Reserve *size* bytes for the run-time stack.
- f fill** (SCO, SVR3)
Fill unassigned memory (gaps in text and data segments, and also the bss segment) with the 16-bit pattern *fill*.
- format format** (new GNU)
Specify the binary format of the files whose names follow. This is the same as the **-b** option.
- G size** (new GNU)
Only for MIPS ECOFF format: set the minimum size of objects to be optimized using the *GP* register.
- G** (Solaris 2)
Produce a shared object in dynamic mode.
- g** (new GNU, XENIX)
Include symbolic information in the output file. The GNU linker accepts this option, but ignores it, since this is the default behaviour.
- h name** (SVR4)
When building a dynamic object, record *name* as the name of the file to link at run time.
- I name** (Solaris 2)
Use *name* as the path name of the interpreter to be written into the program header. In static mode, *name* defaults to no interpreter, and in dynamic mode it defaults to */usr/lib/ld.so.1*.
- i** (new GNU)
Create a relocatable output file. Same as the **-r** option.
- i** (Solaris 2)
Ignore the `LD_LIBRARY_PATH` setting.
- i** (XENIX)
Create separate instruction and data space for small model programs.
- L dir** (all)
Search the given directory for library archives in addition to the default directories. *ld* searches directories supplied with the **-L** option in order of appearance in the argument list and before the default directories.
- l lib** (all)

Search the specified libraries for a library called *liblib.a*. This is the same as the C compiler `-l` option. SunOS4 allows you to write `-l lib.version` to indicate a specific library version number.

- La (XENIX)
Set advisory file locking
- Lm (XENIX)
Set mandatory file locking.
- LI [NENUMBERS] (SCO)
Create a map file including line number information.
- M (GNU, SunOS 4)
Print a load map on the standard output.
- M *mapfile* (Solaris 2)
Read directives to *ld* from *mapfile*.
- M (SCO, SVR3)
Print warning messages for multiply defined external definitions.
- m (SCO, SVR3, SVR4)
Print a load map on the standard output.
- Mx (XENIX)
Specify the memory model. *x* can be *s* (small), *m* (middle), *l* (large), *h* (huge), or *e* (mixed).
- m *emulation* (new GNU)
Emulate the *emulation* linker.
- m *file* (XENIX)
Write a map listing to *file*.
- M[AP] : *number* (SCO)
Create a map listing with up to *number* symbols. *number* defaults to 2048.
- Map *file* (new GNU)
Print a load map to *file*.
- N (GNU, SunOS 4)
Create an OMAGIC format binary. This is the default format for relocatable object files. OMAGIC format binaries have writable text segments. Where appropriate, this option implies `-Bstatic`.
- N (SVR3)
Place the text section at the beginning of the text segment, and the data segment immediately after the text segment.
- N *num* (XENIX)
Set the page size to *num* bytes.

- `-n` (GNU, SunOS 4)
Create an *NMAGIC* format shared executable binary. The text segment is read-only. Where appropriate, this option implies `-Bstatic`.
- `-n num` (XENIX)
Truncate symbol names to *num* characters.
- `-noinhibit-exec` (new GNU)
Create an output file even if errors are encountered during linking.
- `-o file` (all)
Write output to *file* instead of the default *a.out*.
- `-oformat format` (new GNU)
Write the output file in format *format*.
- `-P` (XENIX)
Disable packing of segments.
- `-P` (SunOS 4)
Start the data segment on a page boundary, even if the text segment is not shared.
- `-Qyn` (Solaris 2)
If *yn* is *y*, add an *ident* string to the *.comment* section of the output file identifying the version of the linker used. *cc* does this by default. `-Qn` suppresses this header.
- `-q` (old GNU on BSD)
Create a *QMAGIC* format demand loaded executable binary.
- `-R file` (new GNU)
Read symbol information from *file*, but do not include it in the output.
- `-R` (XENIX)
Ensure a relocation table of non-zero size.
- `-Rd offset` (XENIX)
Set the data segment relocation offset to *offset*.
- `-Rt offset` (XENIX)
Set the text segment relocation offset to *offset*.
- `-R paths` (Solaris 2)
Specify *paths* as a colon-separated list of directories to be searched for libraries by the run-time linker.
- `-r` (all)
Generate a relocatable output file.
- `-S` (GNU, SunOS 4)
Strip only stab symbols from *a.out* files.
- `-s` (all)

- Strip all symbols from the output file. This overrides other strip options.
- SE[MENTS] : *number*** (SCO)
- Allow the program to have *number* segments. The default value is 128.
- sort-common** (new GNU)
- Disable** sorting of common blocks by size.
- STACK] : *size*** (SCO)
- Specify that the stack should be *size* bytes long.
- T *file*** (new GNU)
- Read commands from *file*. These commands override the standard link format. This is the same as the **-c** option.
- T *address*** (old GNU, SunOS 4)
- Start the text segment at *address*.
- Tbss *address*** (new GNU)
- Start the bss segment at *address*.
- Tdata *address*** (GNU, SunOS 4)
- Start the data segment at *address*.
- Ttext *address*** (GNU, SunOS 4)
- Start the text segment at *address*. The same as **-T**.
- t** (GNU)
- Print the names of input files to *stderr* as they are processed.
- t** (SCO, SVR3, SVR4)
- Do not warn about multiply defined symbols of different size.
- u *symbol*** (all)
- Consider *symbol* to be undefined. This can be used to force the extraction of certain files from a library.
- Ur** (new GNU)
- Generate relocatable output, like the **-r** option. For C++ programs only, resolve references to constructors.
- V** (new GNU)
- Print full version number information, including supported emulations.
- V** (SCO, SVR3, Solaris 2)
- Print version number information for *ld*.
- VS *number*** (SCO, SVR3)
- Store version *number* in the optional header of the output file.
- v** (new GNU)
- Print version number information for *ld* only.

- `-version` (new GNU)
Print version number information for `ld` only, then exit.
- `-warn-common` (new GNU)
Warn when a common symbol is combined with another common symbol or with a symbol definition.
- `-X` (GNU, SunOS 4)
Strip local symbols which start with the letter L. This is the default behaviour of the assembler. The new GNU linker will only perform this operation if the `-s` or `-S` options are also specified.
- `-x` (GNU, SCO, SunOS 4, SVR3)
Strip all local symbols. The new GNU linker will only perform this operation if the `-s` or `-S` options are also specified.
- `-Y [L][U], dir` (SCO, SVR3, SVR4 in BSD mode)
Change the default directory used for finding libraries. If L is specified, the standard library directory (LLIBDIR, normally `/usr/lib`) is replaced with `dir`. If U is specified and the linker was built with a second library directory (LLIBDIR), it is replaced with `dir`.
- `-YP, dir` (Solaris 2)
Change the default directory used for finding libraries to `dir`.
- `-Y symbol` (old GNU, SunOS 4)
Trace `symbol` on `stderr` during linking.
- `-z` (old GNU, SunOS 4)
Create a *ZMAGIC* format demand loaded executable binary. On SunOS 4, this implies the `-Bdynamic` option.
- `-z` (SCO, SVR3)
Do not bind anything at address 0, in order to allow run-time detection of null pointers.
- `-z defs` (Solaris 2)
Force a fatal error if any undefined symbols remain at the end of a link. This is the default for executables, but not for relocatable output.
- `-z nodefs` (Solaris 2)
Allow undefined symbols in an executable.
- `-z text` (Solaris 2)
Force a fatal error if any relocations against non-writable, allocatable sections remain when performing a dynamic link.