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SYNOPSIS: How to build LFS for different sub-architectures.

PRIMARY URL:

<http://www.comlore.com/i386-pc-linux-gnu/crosscompiling-x86.txt>

DESCRIPTION:

Additive instructions on how to cross-build a LFS-system for different x86 sub-architectures.

PREREQUISITES:

The command-replacements are applicable for LFS 6.0. Similar changes will probably work fine on other versions of the book; however your mileage may vary since the resources to build a Linux system are under constant revision and replacement. You should probably have either completed a run through the book already or at least read the procedures before you start.

1. CROSSCOMPILING-X86

This hint is originally written by Nicholas Dille <webmaster at rakshas.de>. Later it was updated and maintained by Daniel Baumann. Now maintenance is done by Theodore Bullock <tbullock at Canada.com>

1.1. INTRODUCTION

The GNU Compiler Collection (GCC) can build binaries for multiple platforms.

It is not especially complicated to cross-compile between different sub-architectures, for example, to build i386 binary executables on an i686 computer. On the other hand, to cross-compile between totally different architectures, for example, building PowerPC binary executables on an i386 machine, an entirely different tool-chain is required and is beyond the scope of this hint.

Ideally, all packages should get their information about the target from autoconf configuration parameters and compiler flags. Unfortunately this is not the reality. Some packages use different flags and a few packages, notably GCC and Glibc, need other trickery to fake their auto-detection in place of flags.

Additionally, if you are trying to build LFS on a very old 386 then there is an extra trick to completing the procedure.

This hint does not cover building LFS onto i286 or older machines as these processors lack some critical functionality to handle modern memory management. For information on that topic search the internet for embedded Linux solutions.

1.2. About \$CHOST

As with \$LFS, we will use the variable \$CHOST to specify the type of computer we are compiling on. To cross-compile you have to replace \$CHOST with a value matching for your target computer.

If your target machine is currently running a flavour of Linux then you can get the correct value from your target computer with

```
# uname -m
```

If you have not already a running Linux system on the target machine, use the corresponding value from this list instead:

Intel 386:	i386
Intel 486:	i486
Intel Pentium 1 and MMX:	i586
Intel Pentium Pro, 2, 3, 4 and M:	i686
AMD K5, K6-1, K6-2 and K6-3:	i586
AMD Athlon 1, 2, 3, 4 and 5:	i686
IDT WinChip-C6, WinChip2:	i486
VIA C3:	i486

The rest of the hint assumes you have set \$CHOST as an environment variable, for example

```
# export CHOST="i386-pc-linux-gnu"
```

1.3. About \$CFLAGS and \$CXXFLAGS

\$CFLAGS and \$CXXFLAGS are environment variable that pass user flags to GCC and G++ respectively. Often, they are used to set the optimization level (-O n , where n is an integer). For details about optimization, please refer to the optimization hint. Here, we force GCC to compile for the desired sub-architecture using -march.

Choose from this list:

Intel 386	i386
Intel 486	i486
Intel Pentium 1:	pentium
Intel Pentium MMX:	pentium-mmx
Intel Pentium Pro:	pentiumpro
Intel Pentium 2:	pentium2
Intel Pentium 3:	pentium3
Intel Pentium 4 and M:	pentium4
AMD K5:	pentium
AMD K6-1:	k6
AMD K6-2:	k6-2
AMD K6-3:	k6-3
AMD Athlon 1 (Classic):	athlon

AMD Athlon 2 (Thunderbird):	athlon-tbird
AMD Athlon 3 (XP):	athlon-xp
AMD Athlon 4 (Palomino):	athlon-4
AMD Athlon 5 (MP):	athlon-mp
IDT WinChip-C6:	winchip-c6
IDT WinChip-2:	winchip2
VIA C3:	c3

The rest of the hint assumes you have set \$CFLAGS and \$CXXFLAGS as environment variables, for example:

```
export CFLAGS="-march=i386"  
export CXXFLAGS="-march=i386"
```

1.3.1. ATTENTION REGARDING OPTIMIZATION

If you use optimization, in the majority of cases the binaries can only be used on the target machine. This means, sharing self-generated binary-packages between different hosts is not possible.

2. LFS-Book

The following sections are ordered as a skeleton of the information in the LFS book

2.1. Chapter 4: Final Preparations

2.1.1. About \$LFS

Add:

```
export CHOST="<value>"  
export CFLAGS="<value>"  
export CXXFLAGS="<value>"
```

Note: Please replace <value> with the proper strings as was discussed earlier

2.2. Chapter 5: Constructing a Temporary System

2.2.1. Binutils-2.15.91.0.2

Change:

```
../binutils-2.14/configure --prefix=/tools --disable-nls
```

To:

```
../binutils-2.14/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --disable-nls
```

2.2.2. GCC-3.4.1 - Pass 1

Change:

```
../gcc-3.4.1/configure --prefix=/tools \  
--libexecdir=/tools/lib --with-local-prefix=/tools \  
--disable-nls --enable-shared --enable-languages=c
```

To:

```
../gcc-3.4.1/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --libexecdir=/tools/lib \  
--with-local-prefix=/tools --disable-nls \  
--enable-shared --enable-languages=c
```

And then, change:

```
make BOOT_LDFLAGS="-static" bootstrap
```

To:

```
make BOOT_CFLAGS="$CFLAGS" BOOT_LDFLAGS="-static" bootstrap
```

2.2.3. Linux-Libc-Headers-2.6.8.1

No changes - we are just copying the header files here.

2.2.4. Glibc-2.3.4-20040701

Ok, this one is a bit trickier and what you put here can have some important ramifications later. If your target machine is a 486 or higher you should follow the (>=486) instructions otherwise you should follow the (386) instructions. The reason for this is that the basic 386 instruction set is missing one of the atomic instructions important to multi-threading with the NPTL threading system. Instead you will use the linuxthreads library which does not require this instruction.

Change:

```
../glibc-2.3.4-20040701/configure --prefix=/tools \  
--disable-profile --enable-add-ons=nptl --with-tls \  
--with-__thread --enable-kernel=2.6.0 \  
--with-binutils=/tools/bin --without-gd --without-cvs \  
--with-headers=/tools/glibc-kernheaders
```

(>=486)To:

```
../glibc-2.3.4-20040701/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --disable-profile --enable-add-ons=nptl \  
--with-tls --with-__thread --enable-kernel=2.6.0 \  
--with-binutils=/tools/bin --without-gd --without-cvs \  
--with-headers=/tools/glibc-kernheaders
```

(386)To:

```
../glibc-2.3.4-20040701/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --disable-profile --enable-add-ons=linuxthreads \  
--with-tls --without-__thread --enable-kernel=2.6.0 \  
--with-binutils=/tools/bin --without-gd --without-cvs \  
--with-headers=/tools/glibc-kernheaders
```

And then change:

```
make install
```

To:

```
make cross_compiling=no install
```

Note: This does not affect cross compiling for sub-architectures (it prevents Glibc to look for a cross compiler and uses the native one).

2.2.5. Adjusting the tool-chain

No changes - we are using preconfigured code.

2.2.6. Tcl-8.4.7

Change:

```
./configure --prefix=/tools
```

To

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.7. Expect-5.42.1

Change:

```
./configure --prefix=/tools --with-tcl=/tools/lib --with-x=no
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --with-tcl=/tools/lib --with-x=no
```

2.2.8. DejaGnu-1.4.4

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.9. GCC-3.4.1- Pass 2

Change:

```
../gcc-3.4.1/configure --prefix=/tools \  
--libexecdir=/tools/lib --with-local-prefix=/tools \  
--enable-clocale=gnu --enable-shared \  
--enable-threads=posix --enable-__cxa_atexit \  
--enable-languages=c,c++ --disable-libstdcxx-pch
```

To:

```
../gcc-3.4.1/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --libexecdir=/tools/lib \  
--with-local-prefix=/tools --enable-clocale=gnu \  
--enable-shared --enable-threads=posix \  
--enable-__cxa_atexit--enable-languages=c,c++ \  
--disable-libstdcxx-pch
```

And then change:

```
Make
```

To:

```
make BOOT_CFLAGS="$CFLAGS" BOOT_CXXFLAGS="$CXXFLAGS"
```

2.2.10. Binutils-2.15.91.0.2 - Pass 2

Change:

```
../binutils-2.15.91.0.2/configure --prefix=/tools \  
--enable-shared --with-lib-path=/tools/lib
```

To:

```
../binutils-2.15.91.0.2/configure --host="$CHOST" --target="$CHOST" --  
prefix=/tools --enable-shared --with-lib-path=/tools/lib
```

2.2.11. Gawk-3.1.4

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.12. Coreutils-5.2.1

Change:

```
DEFAULT_POSIX2_VERSION=199209 ./configure --prefix=/tools
```

To:

```
DEFAULT_POSIX2_VERSION=199209 ./configure \  
--host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.13. Bzip2-1.0.2

Add:

```
cp Makefile Makefile.backup &&  
sed -e 's%$(BIGFILES)%$(BIGFILES) $(OPT)%' \  
Makefile.backup > Makefile &&  
cp Makefile-libbz2_so Makefile-libbz2_so.backup &&  
sed -e 's%$(BIGFILES)%$(BIGFILES) $(OPT)%' \  
Makefile-libbz2_so.backup > Makefile-libbz2_so
```

Change:

```
make PREFIX=/tools install
```

To:

```
make OPT="$CFLAGS" PREFIX=/tools install
```

2.2.14. Gzip-1.3.5

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.15. Diffutils-2.8.1

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```


2.2.16. Findutils-4.1.20

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.17. Make-3.80

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.18. Grep-2.5.1

Change:

```
./configure --prefix=/tools \  
--disable-perl-regexp --with-included-regex
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools \  
--disable-perl-regexp --with-included-regex
```

2.2.19. Sed-4.1.2

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.20. Gettext-0.14.1

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.21. Ncurses-5.4

Change:

```
./configure --prefix=/tools --with-shared \  
--without-debug --without-ada --enable-overwrite
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/tools --with-shared \  
--without-debug --without-ada --enable-overwrite
```

2.2.22. Patch-2.5.4

Change:

```
CPPFLAGS=-D_GNU_SOURCE ./configure --prefix=/tools
```

To:

```
CPPFLAGS=-D_GNU_SOURCE ./configure \  
--host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.23. Tar-1.14

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.24. Texinfo-4.7

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.25. Bash-3.0

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.26. M4-1.4.2

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.27. Bison-1.875a

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.28. Flex-2.5.31

Change:

```
./configure --prefix=/tools
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/tools
```

2.2.29. Util-linux-2.12b

Change:

```
./configure
```

To:

```
./configure --host="$CHOST" --target="$CHOST"
```

2.2.30. Perl-5.8.5

Change:

```
./configure.gnu --prefix=/tools -Dstatic_ext='IO Fcntl POSIX'
```

To:

```
./configure.gnu \  
-Dhost="$CHOST" -Dtarget="$CHOST" -Darchname="$CHOST" \  
--prefix=/tools -Dstatic_ext='IO Fcntl POSIX'
```

2.3. Chapter 6: Installing Basic System Software

2.3.1. Entering the chroot environment

Change:

```
chroot "$LFS" /tools/bin/env -i \  
HOME=/root TERM="$TERM" PS1='\u:\w\$ ' \  
PATH=/bin:/usr/bin:/sbin:/usr/sbin:/tools/bin \  
/tools/bin/bash --login +h
```

To:

```
chroot "$LFS" /tools/bin/env -i \  
$CHOST="<value>" $CFFLAGS="<value>" $CXXFLAGS="<value>" \  
HOME=/root TERM="$TERM" PS1='\u:\w\$ ' \  
PATH=/bin:/usr/bin:/sbin:/usr/sbin:/tools/bin \  
/tools/bin/bash --login +h
```

Note: Please replace <value> with the proper strings according to the introduction.

2.3.2. Creating devices with Make_devices-1.2

No changes - we are just creating the devices files here.

2.3.3. Linux-Libc-Headers-2.6.8.1

No changes - we are just copying the header files here.

2.3.4. Man-pages-1.67

No changes - we are just copying the man-pages here.

2.3.5. Glibc-2.3.4-20040701

Ok, this one is a bit trickier and what you put here can have some important ramifications later. If your target machine is a 486 or higher you should follow the (≥ 486) instructions otherwise you should follow the (386) instructions. The reason for this is that the basic 386 instruction set is missing one of the atomic instructions important to multi-threading with the NPTL threading system. Instead you will use the linuxthreads library which does not require this instruction.

Change:

```
../glibc-2.3.4-20040701/configure --prefix=/usr \  
--disable-profile --enable-add-ons=nptl --with-tls \  
--with-__thread --enable-kernel=2.6.0 --without-cvs \  
--libexecdir=/usr/lib/glibc \  
--with-headers=/tools/glibc-kernheaders
```

(≥ 486)To:

```
../glibc-2.3.4-20040701/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --disable-profile --enable-add-ons=nptl \  
--with-tls --with-__thread --enable-kernel=2.6.0 \  
--without-cvs --libexecdir=/usr/lib/glibc \  
--with-headers=/tools/glibc-kernheaders
```

(386)To:

```
../glibc-2.3.4-20040701/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --disable-profile --enable-add-ons=linuxthreads \  
--with-tls --without-__thread --enable-kernel=2.6.0 \  
--without-cvs --libexecdir=/usr/lib/glibc \  
--with-headers=/tools/glibc-kernheaders
```

And then change:

```
make install
```

To:

```
make cross_compiling=no install
```

Note: This does not affect cross compiling for sub-architectures (it prevents Glibc to look for a cross compiler and uses the native one).

2.3.6. Re-adjusting the toolchain

No changes - we are using preconfigured code.

2.3.7. Binutils-2.15.91.0.2

Change:

```
../binutils-2.15.91.0.2/configure --prefix=/usr --enable-shared
```

To:

```
../binutils-2.15.91.0.2/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --enable-shared
```

2.3.8. GCC-3.4.1

Change:

```
../gcc-3.4.1/configure --prefix=/usr \  
--libexecdir=/usr/lib --enable-shared \  
--enable-threads=posix --enable-__cxa_atexit \  
--enable-clocale=gnu --enable-languages=c,c++
```

To:

```
../gcc-3.4.1/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr \  
--libexecdir=/usr/lib --enable-shared \  
--enable-threads=posix --enable-__cxa_atexit \  
--enable-clocale=gnu --enable-languages=c,c++
```

And change:

```
Make
```

To:

```
make BOOT_CFLAGS="$CFLAGS" BOOT_CXXFLAGS="$CXXFLAGS"
```

2.3.9. Coreutils-5.2.1

Change:

```
DEFAULT_POSIX2_VERSION=199209 ./configure --prefix=/usr
```

To:

```
DEFAULT_POSIX2_VERSION=199209 ./configure \  
--host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.10. Zlib-1.2.1

Change:

```
./configure --prefix=/usr --shared
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --shared
```

2.3.11. Mktmp-1.5

Change:

```
./configure --prefix=/usr --with-libc
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --shared
```

2.3.12. Iana-Etc-1.01

No changes - we are just copying files.

2.3.13. Findutils-4.1.20

Change:

```
./configure --prefix=/usr --libexecdir=/usr/lib/locate \  
--localstatedir=/var/lib/misc
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --libexecdir=/usr/lib/locate \  
--localstatedir=/var/lib/misc
```

2.3.14. Gawk-3.1.4

Change:

```
./configure --prefix=/usr --libexecdir=/usr/lib
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --libexecdir=/usr/lib
```

2.3.15. Ncurses-5.4

Change:

```
./configure --prefix=/usr --with-shared --without-debug
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --with-shared --without-debug
```

2.3.16. Readline-5.0

Change:

```
./configure --prefix=/usr --libdir=/lib
```

To:

```
./configure --prefix=/usr --libdir=/lib --host="$CHOST" --target="$CHOST"
```

As well you should change

```
make SHLIB_XLDFLAGS=-lncurses
```

To:

```
make SHLIB_XLDFLAGS=-lncurses CFLAGS="$CFLAGS -march=ix86"
```

Where x is the level of your CPU

2.3.17. Vim-6.3

Change:

```
./configure --prefix=/usr --enable-multibyte
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--enable-multibyte --prefix=/usr
```

2.3.18. M4-1.4.2

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```


2.3.19. Bison-1.875a

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.20. Less-382

Change:

```
./configure --prefix=/usr --bindir=/bin --sysconfdir=/etc
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --bindir=/bin --sysconfdir=/etc
```

2.3.21. Groff-1.19.1

Change:

```
PAGE=letter ./configure --prefix=/usr
```

To:

```
PAGE=letter ./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr
```

2.3.22. Sed-4.1.2

Change:

```
./configure --prefix=/usr --bindir=/bin
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --bindir=/bin
```

2.3.23. Flex-2.5.31

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.24. Gettext-0.14.1

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.25. Inetutils-1.4.2

Change:

```
./configure --prefix=/usr --libexecdir=/usr/sbin \  
--sysconfdir=/etc --localstatedir=/var \  
--disable-logger --disable-syslogd \  
--disable-whois --disable-servers
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --libexecdir=/usr/sbin \  
--sysconfdir=/etc --localstatedir=/var \  
--disable-logger --disable-syslogd \  
--disable-whois --disable-servers
```

2.3.26. Iproute2-2.6.8-040823

After:

```
./configure
```

Add:

```
mv Makefile Makefile.backup &&  
sed 's/${CCOPTS}/${CCOPTS} -march=${OPT}/' Makefile.backup > Makefile
```

Change:

```
make SBINDIR=/sbin
```

To:

```
make SBINDIR=/sbin OPT=iX86
```

Where X is 3,4,5 or 6 (as appropriate)

2.3.27. Perl-5.8.5

Change:

```
./configure.gnu --prefix=/usr -Dpager="/bin/less -isR"
```

To:

```
./configure.gnu \  
-Dhost="$CHOST" -Dtarget="$CHOST -Darchname="$CHOST" \  
--prefix=/usr -Dpager="/bin/less -isR"
```

2.3.28. Texinfo-4.7

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.29. Autoconf-2.59

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.30. Automake-1.9.1

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.31. Bash-3.0

Change:

```
./configure --prefix=/usr --bindir=/bin
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --bindir=/bin
```

2.3.32. File-4.10

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.33. Libtool-1.5.6

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.34. Bzip2-1.0.2

Add:

```
cp Makefile Makefile.backup
sed -e 's%$(BIGFILES)%$(BIGFILES) $(OPT)%' \
    Makefile.backup > Makefile
cp Makefile-libbz2_so Makefile-libbz2_so.backup
sed -e 's%$(BIGFILES)%$(BIGFILES) $(OPT)%' \
    Makefile-libbz2_so.backup > Makefile-libbz2_so
```

Change:

```
make -f Makefile-libbz2_so
```

To:

```
make OPT="$CFLAGS" -f Makefile-libbz2_so
```

Change:

```
make
```

To:

```
make OPT="$CFLAGS"
```

2.3.35. Diffutils-2.8.1

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.36. Kbd-1.12

Change:

```
make
```

To:

```
make CFLAGS="$CFLAGS"
```

2.3.37. E2fsprogs-1.35

Change:

```
../e2fsprogs-1.35/configure --prefix=/usr --with-root-prefix="" \  
--enable-elf-shlibs
```

To:

```
../e2fsprogs-1.35/configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --with-root-prefix="" \  
--enable-elf-shlibs
```

2.3.38. Grep-2.5.1

Change:

```
./configure --prefix=/usr --bindir=/bin \  
--with-included-regex
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --bindir=/bin \  
--with-included-regex
```

2.3.39. Grub-0.95

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.40. Gzip-1.3.5

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target=$CHOST --prefix=/usr
```

2.3.41. Man-1.5o

Add:

```
cp man2html/Makefile.in man2html/Makefile.in.backup  
sed -e "s/CFLAGS = /CFLAGS = $CFLAGS /" \  
man2html/Makefile.in.backup > man2html/Makefile.in
```

Change:

```
./configure -default -confdir=/etc
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
-default -confdir=/etc
```

2.3.42. Make-3.80

Change:

```
./configure --prefix=/usr
```

To:

```
./configure --host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.43. Module-Init-Tools-3.0

Change:

```
./configure --prefix="" --enable-zlib
```

To:

```
./configure --prefix="" --enable-zlib --host="$CHOST" --target="$CHOST"
```

Add:

```
mv Makefile Makefile.backup &&  
sed 's/CFLAGS = /CFLAGS = -march=$(OPT)/' Makefile.backup > Makefile
```

Change:

```
make
```

To:

```
make OPT=$CFLAGS
```

2.3.44. Patch-2.5.4

Change:

```
CPPFLAGS=-D_GNU_SOURCE ./configure --prefix=/usr
```

To:

```
CPPFLAGS=-D_GNU_SOURCE ./configure \  
--host="$CHOST" --target="$CHOST" --prefix=/usr
```

2.3.45. Procps-3.2.3

Change:

```
make
```

To:

```
make OPT="$CFLAGS"
```

Note: The build process will fail if your \$CFLAGS does not contain the -O_n switch. If that is the case, please use the line

```
make OPT="$CFLAGS -O2"
```

instead.

2.3.46. Psmisc-21.5

Change:

```
./configure --prefix=/usr --exec-prefix=/
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --exec-prefix=/
```

And change:

```
make
```

To:

```
make AM_CFLAGS="$CFLAGS"
```

2.3.47. Shadow-4.0.4.1

Change:

```
./configure --libdir=/usr/lib --enable-shared
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--libdir=/usr/lib --enable-shared
```

2.3.48. Syslogd-1.4.1

Change:

```
make
```

To:

```
make RPM_OPT_FLAGS="$CFLAGS"
```

2.3.49. Sysvinit-2.85

Change:

```
make -C src
```

To:

```
make CFLAGS="-Wall -D_GNU_SOURCE $CFLAGS" -C src
```

2.3.50. Tar-1.14

Change:

```
./configure --prefix=/usr --bindir=/bin --libexecdir=/usr/sbin
```

To:

```
./configure --host="$CHOST" --target="$CHOST" \  
--prefix=/usr --bindir=/bin --libexecdir=/usr/sbin
```

2.3.51. Udev-030

No changes should be necessary assuming that the CFLAGS is set appropriately as discussed in Section 1.3 About \$CFLAGS and \$CXXFLAGS

2.3.52. Util-linux-2.12b

Change:

```
./configure
```

To:

```
./configure --host="$CHOST" --target="$CHOST"
```

2.4. Chapter 7: Setting up System Bootscripts

2.4.1. LFS-Bootscripts-2.2.2

No changes - we are just copying the scripts here.

2.5. Chapter 8: Making the LFS system bootable

2.5.1. Linux-2.6.8.1

Select your processor under 'Processor family' in the 'Processor type and features' menu.

2.6. The End

It may be a good idea to keep the compiler flags for future use

```
echo "export CFLAGS=\"$(echo $CFLAGS)\"" >> /etc/profile  
echo "export CXXFLAGS=\"$(echo $CXXFLAGS)\"" >> /etc/profile
```

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- Yann Guidon <whygee at f-cpu.org> for extending the uname kernel-module

4. CHANGELOG:

[2005-06-22]

- Updated to LFS-6.0
- Added 386 specific commands to glibc
- Fixed typographic mistakes and extended some explanation

[2004-07-10]

- Updated to LFS-5.1.1
- Glibc-command revised (Thanks to Kevin White <kwhite at kevbo.org>)
- Typographic mistakes corrected

[2004-05-29]

- Typographic mistakes corrected

[2004-05-22]

- Updated to LFS 5.1.
- Minor text changes.

[2004-01-26]

- Updated to LFS 5.0.
- New hint format.
- Major text changes.

[2003-07-23]

- Initial revision.