

CentOS ARM 开发环境建立

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1、GCC 安装

1.1、用安装 DVD 为 pirut 创建本地源

参考：[利用安装光盘创建本地 yum 源补装 RPM 软件包](#)

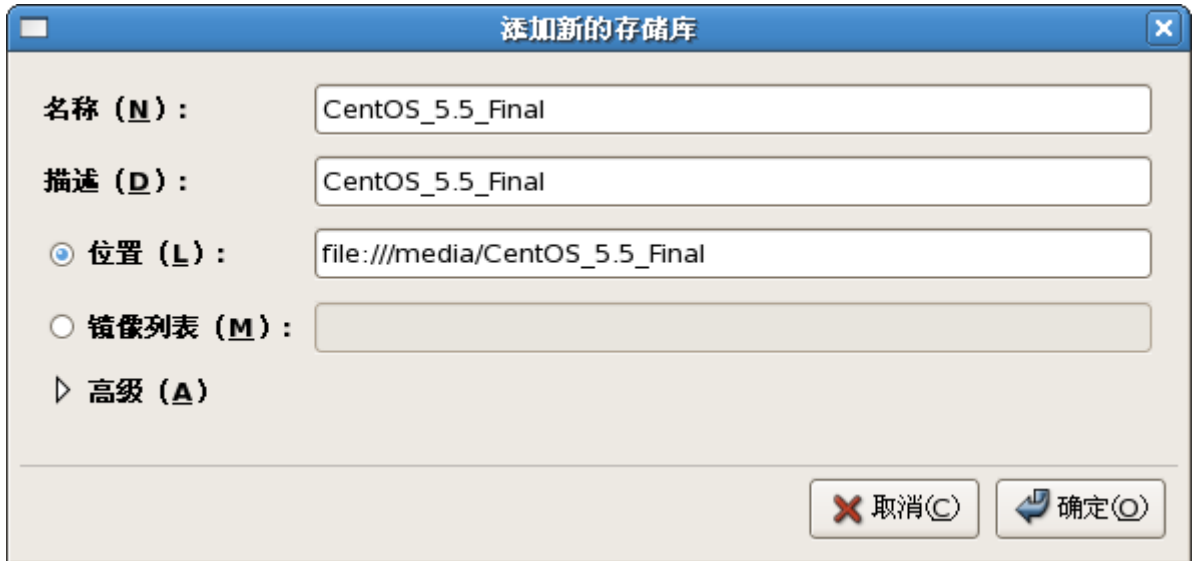
点击“应用程序”——“添加/删除软件”



点击“编辑”——“软件存储库”



点击“添加”



点击“确定”



取消选择“addons”，“base”，“extras”，“updates”，以避免更新软件时从网络下载安装包而导致速度过慢。



点击“关闭”

1.2、安装 GCC

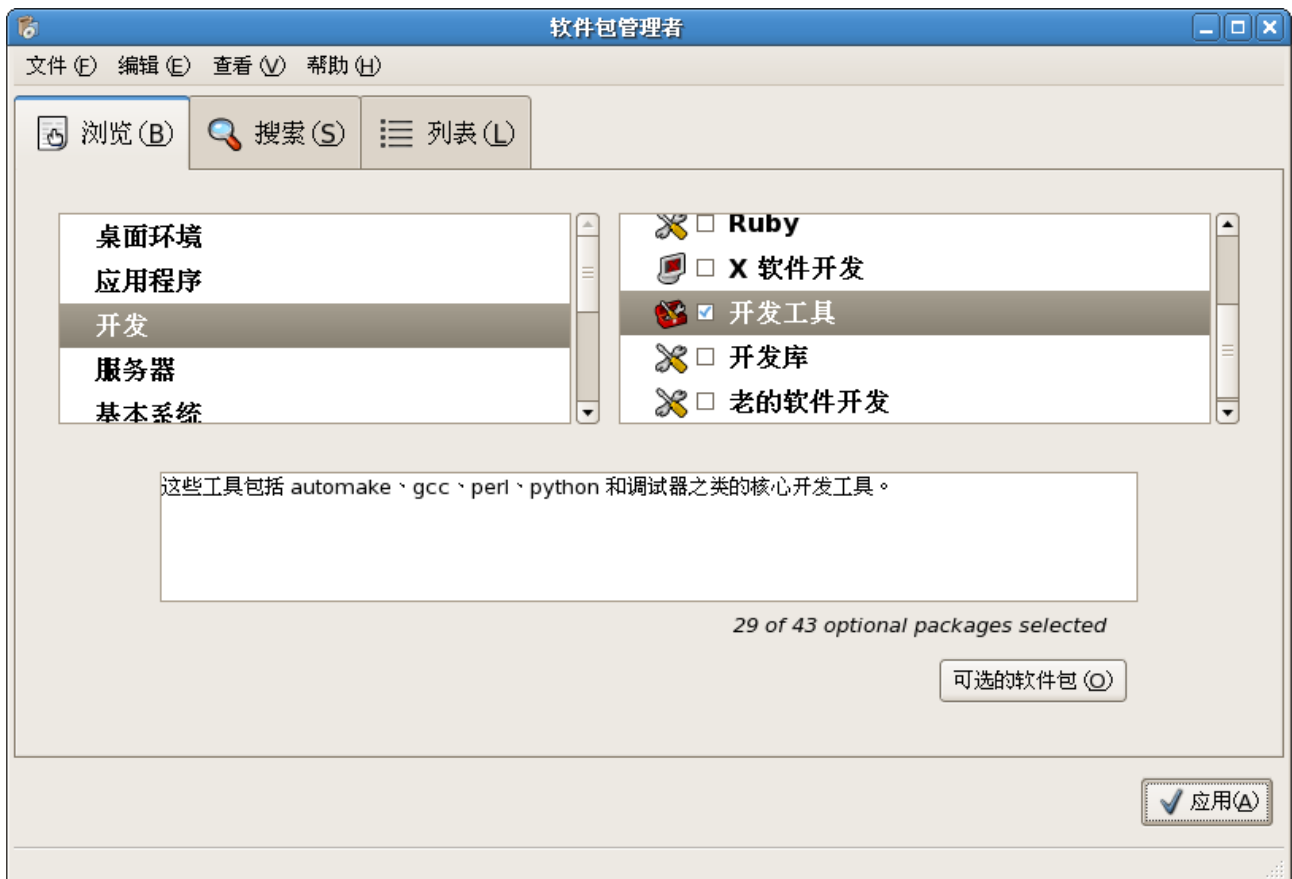
关闭“软件包管理器”，并重新打开，点击“浏览”——“开发工具”



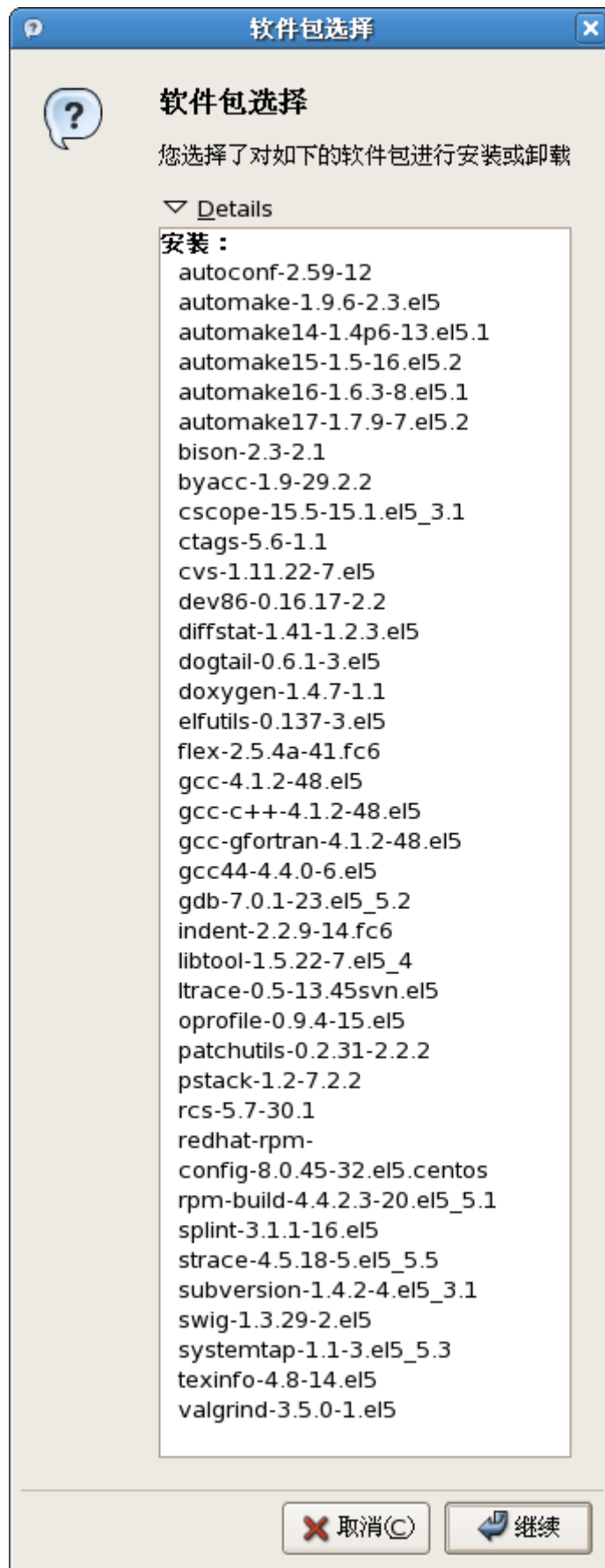
点击“可选的软件包”



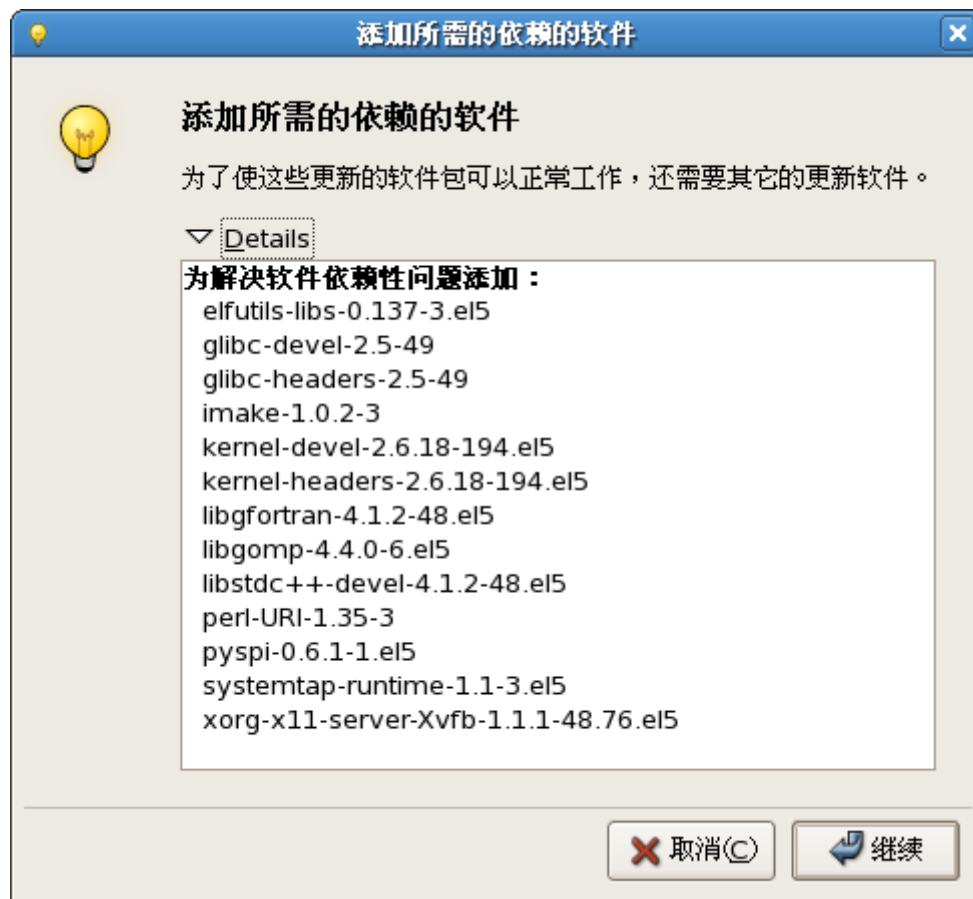
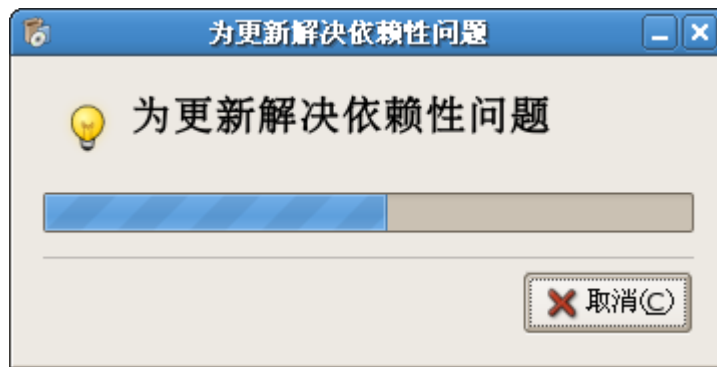
选中“gcc44-4.4.0-6.el5.i386”，点击“关闭”



点击“应用”

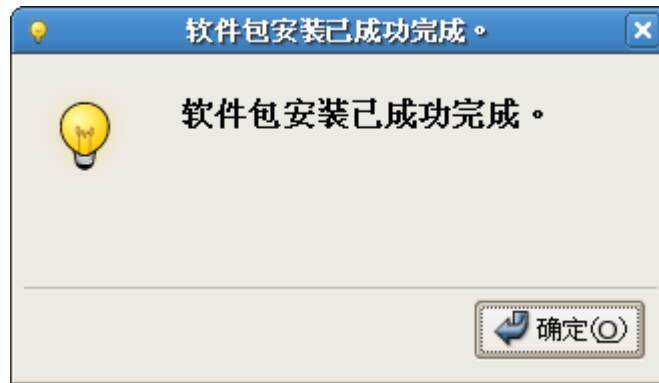


点击“继续”



点击“继续”





点击“确定”，并关闭“软件包管理者”
打开终端，运行“gcc -version”

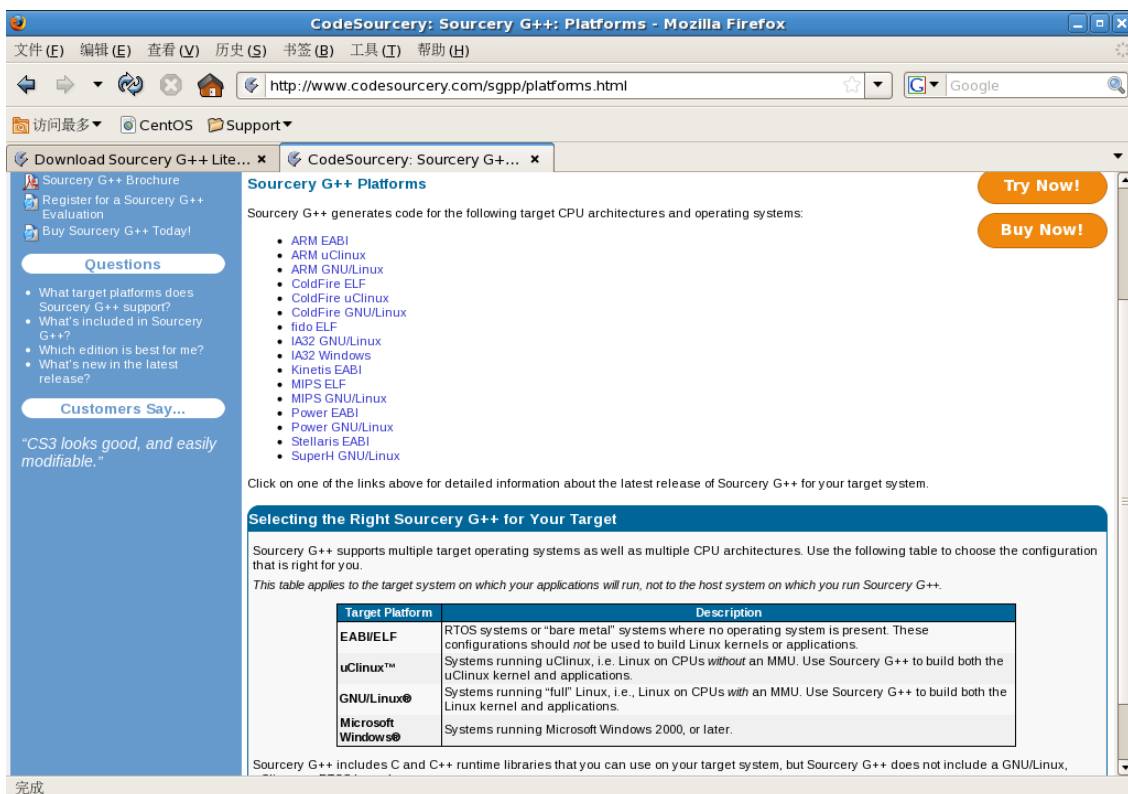
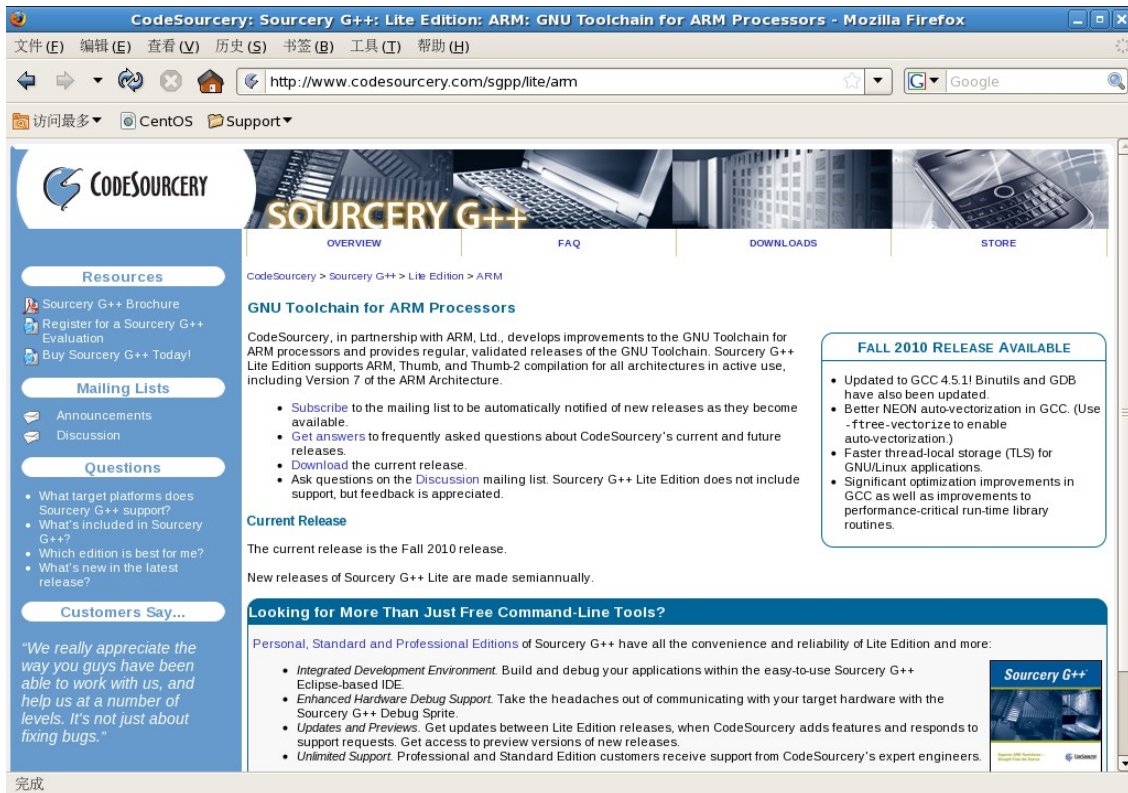
A terminal window with a blue title bar 'arci@localhost:~' and standard window controls. The menu bar includes '文件(F)', '编辑(E)', '查看(V)', '终端(T)', '标签(B)', and '帮助(H)'. The terminal content shows the command '[arci@localhost ~]\$ gcc --version' and its output: 'gcc (GCC) 4.1.2 20080704 (Red Hat 4.1.2-48)', 'Copyright (C) 2006 Free Software Foundation, Inc.', and a disclaimer in Chinese. The prompt '[arci@localhost ~]\$' is followed by a cursor. A vertical scrollbar is on the right side of the terminal area.

GCC 安装完成。

2、ARM 交叉编译工具链安装

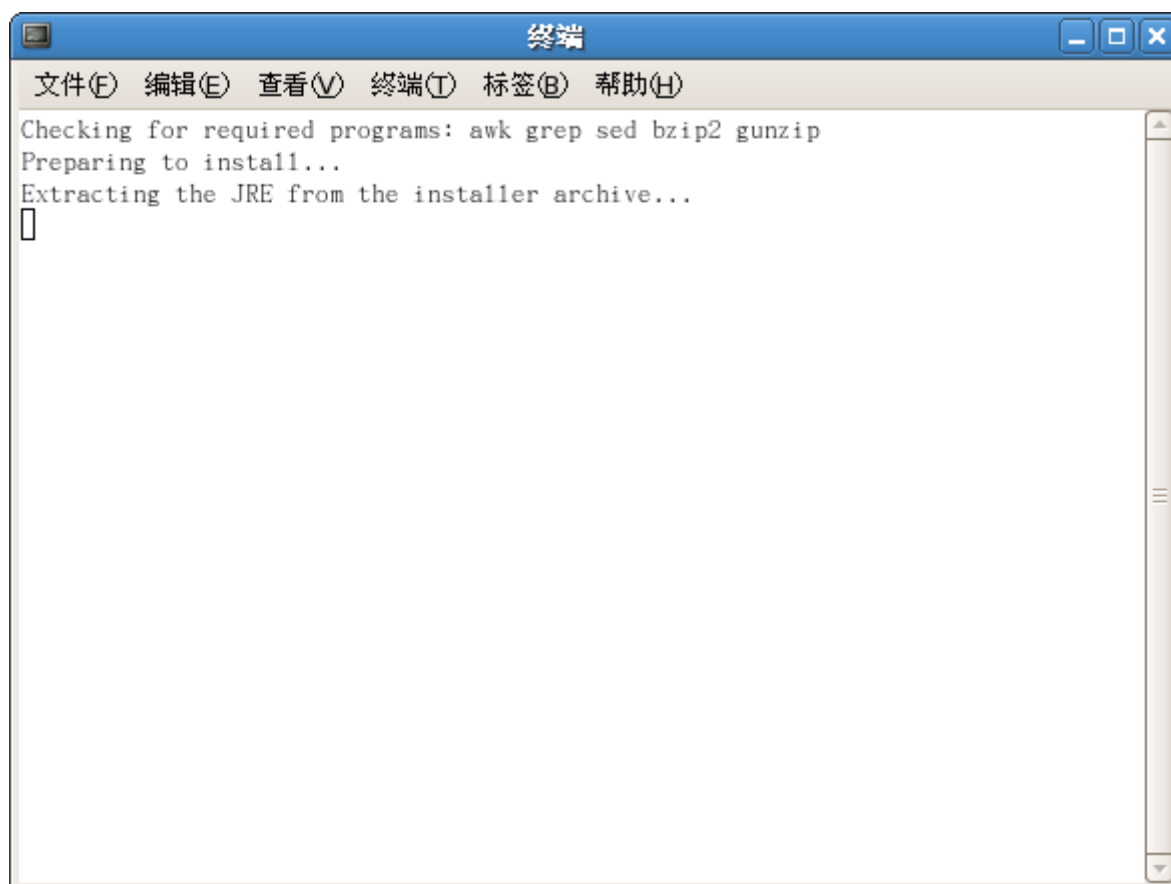
CodeSourcery G++是基于 GNU 工具链的一个完整的软件开发环境，支持大多数的 CPU 和操作系统。

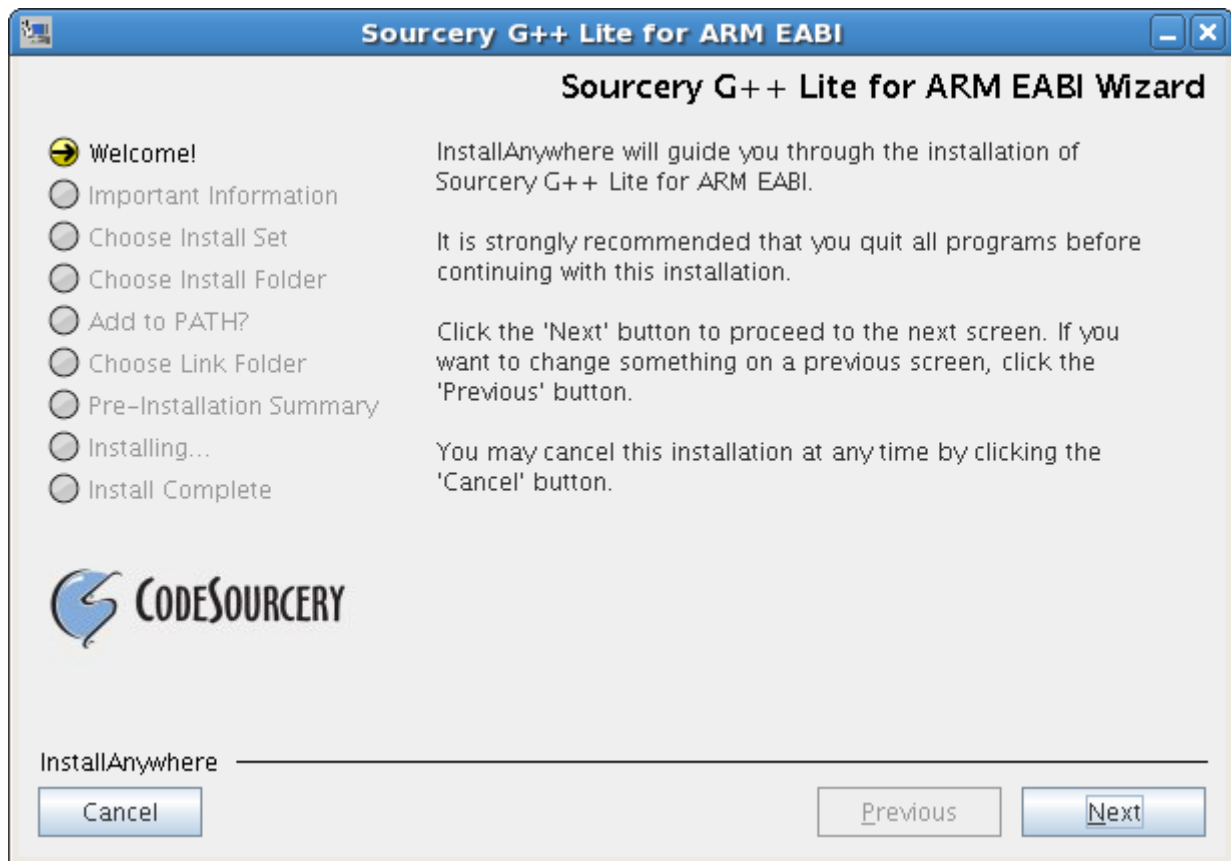
CodeSourcery G++包含 Gnu C/C++编译器、调试器、eclipse IDE，是软件开发人员的最佳选择。



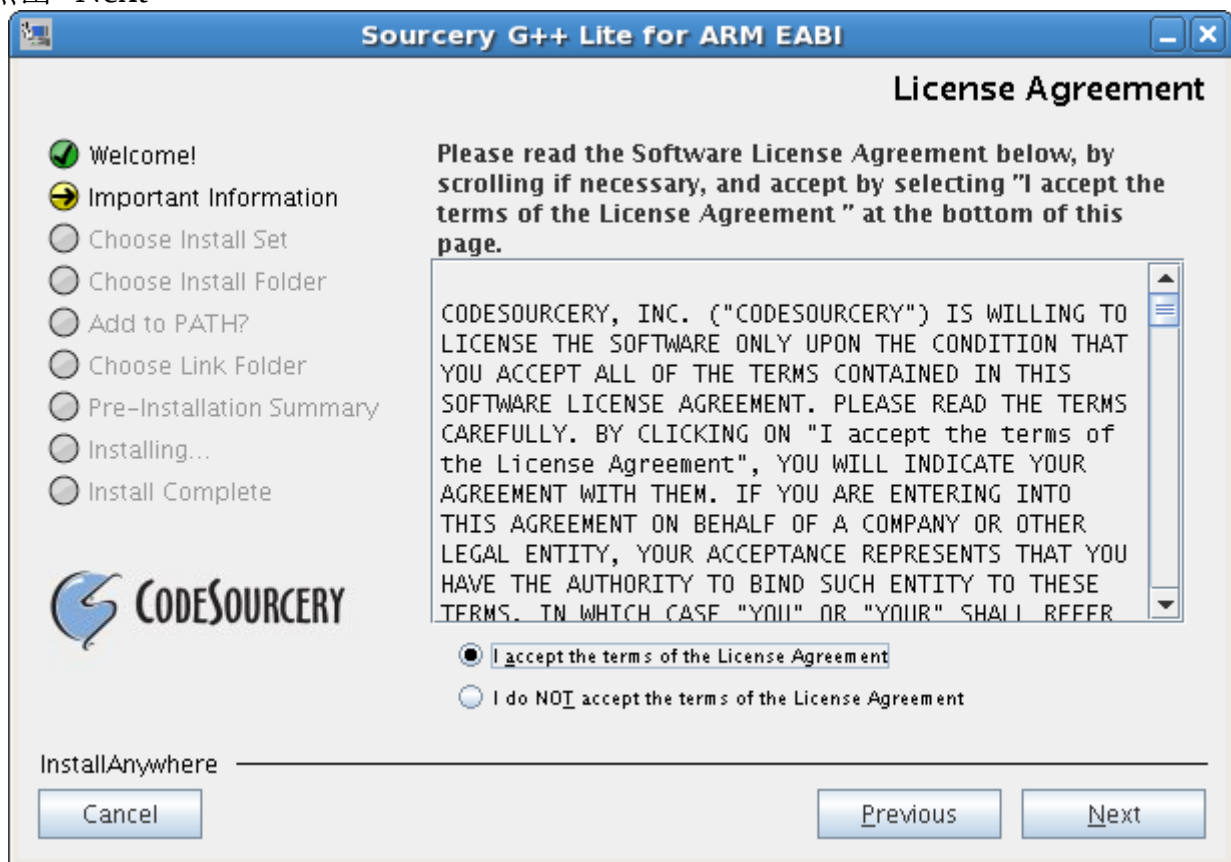
下载: [Sourcery G++ Lite 2010.09-51 for ARM EABI](#)

双击下载的文件“arm-2010.09-51-arm-none-eabi.bin”

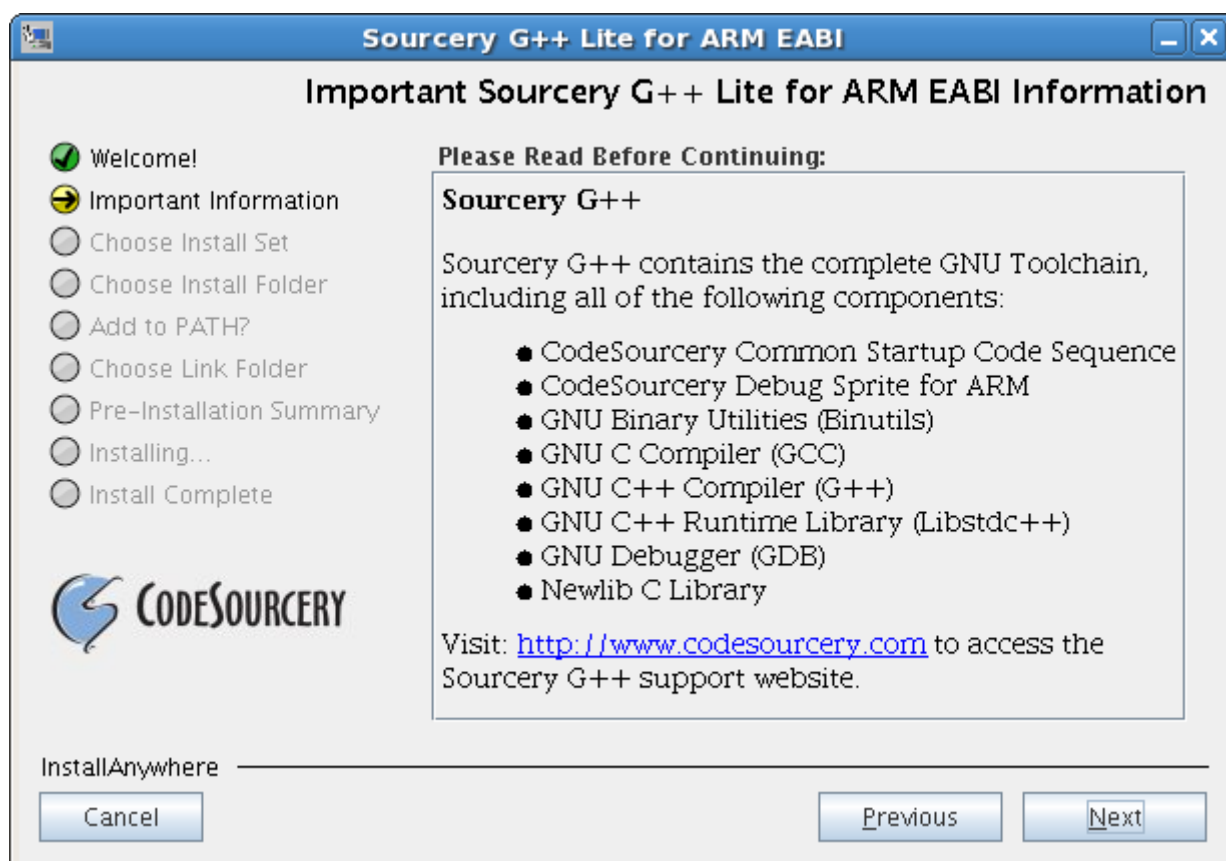




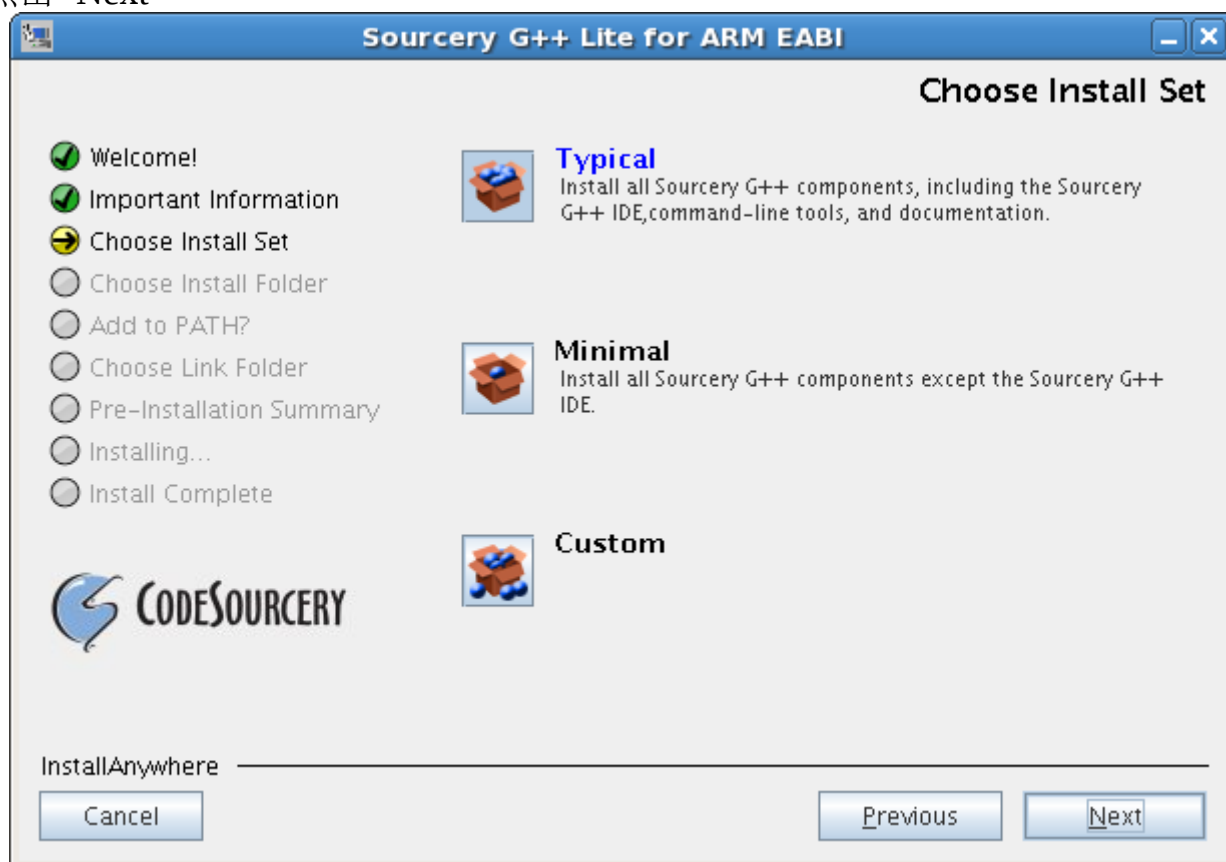
点击“Next”



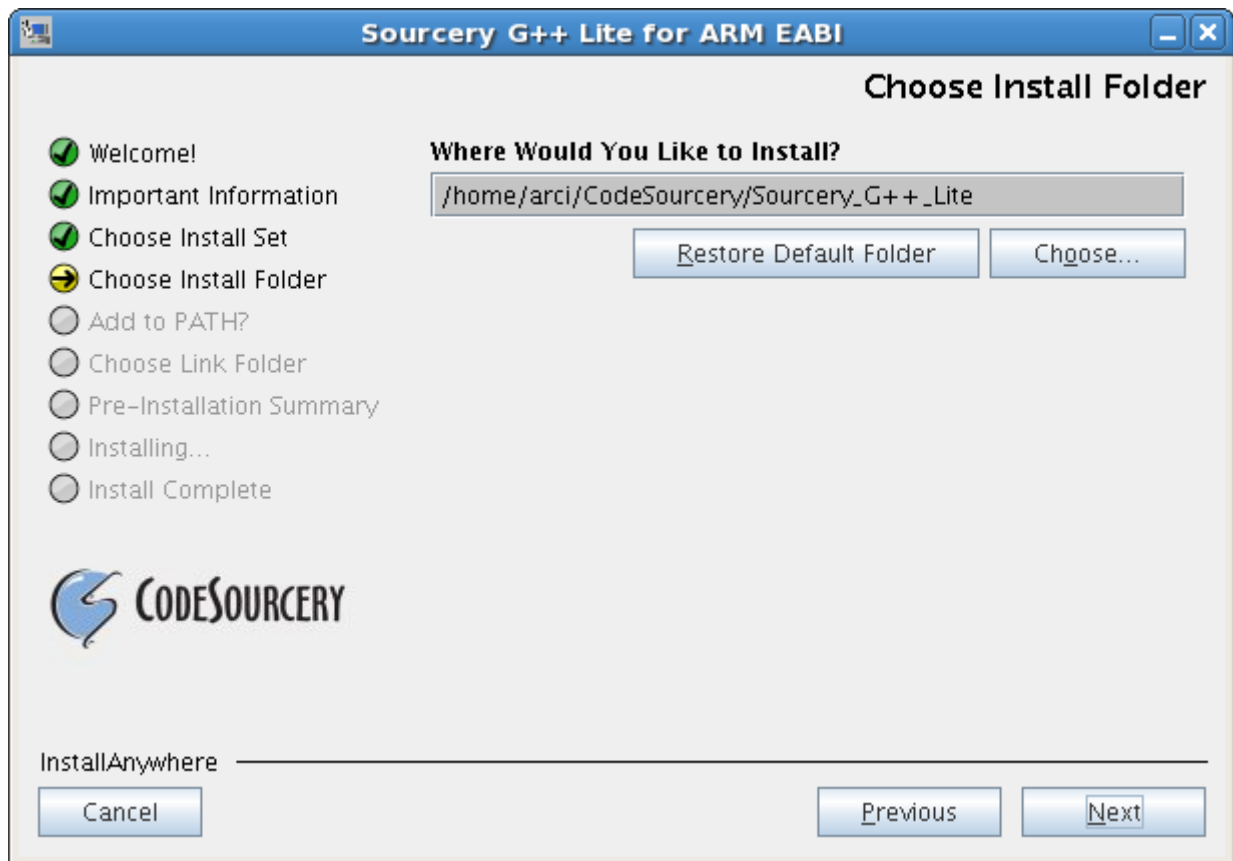
选择“I accept the terms of the License Agreement”，点击“Next”



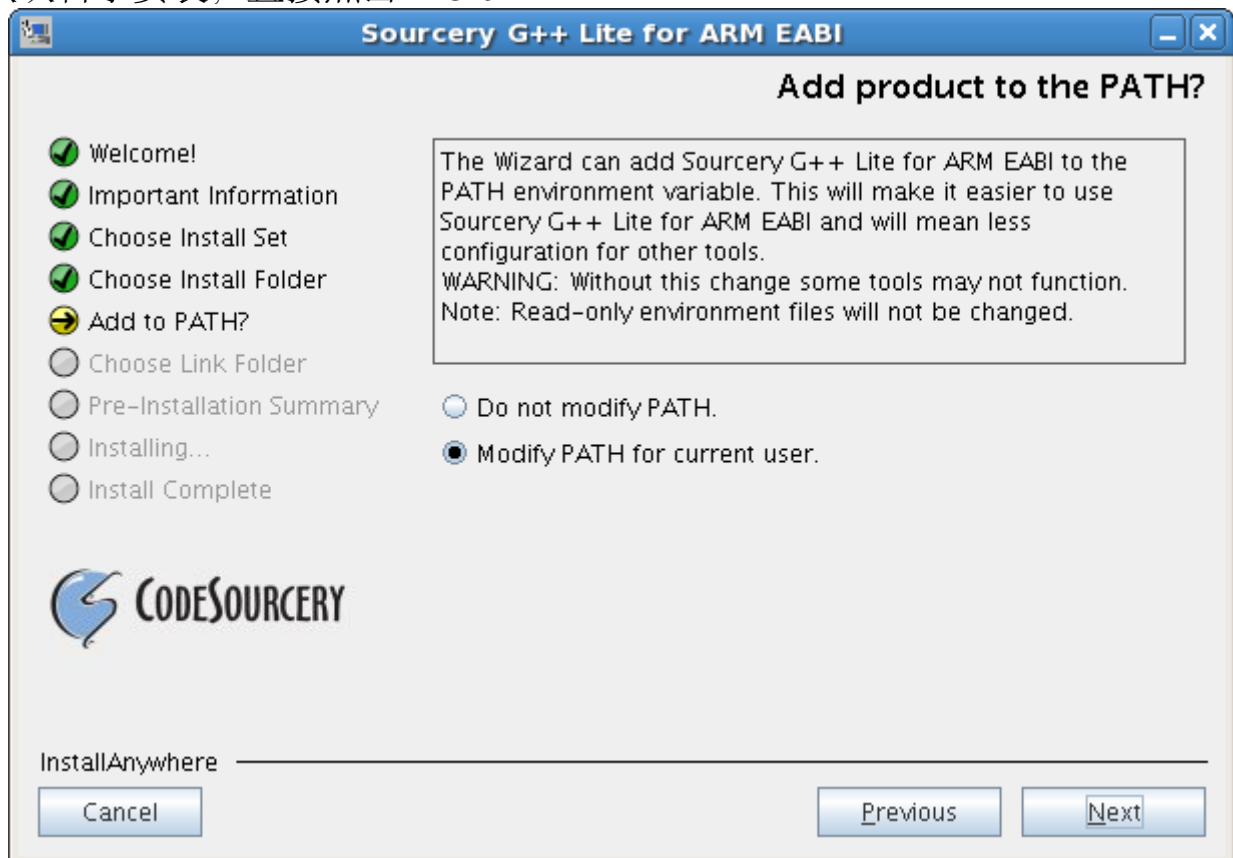
点击“Next”



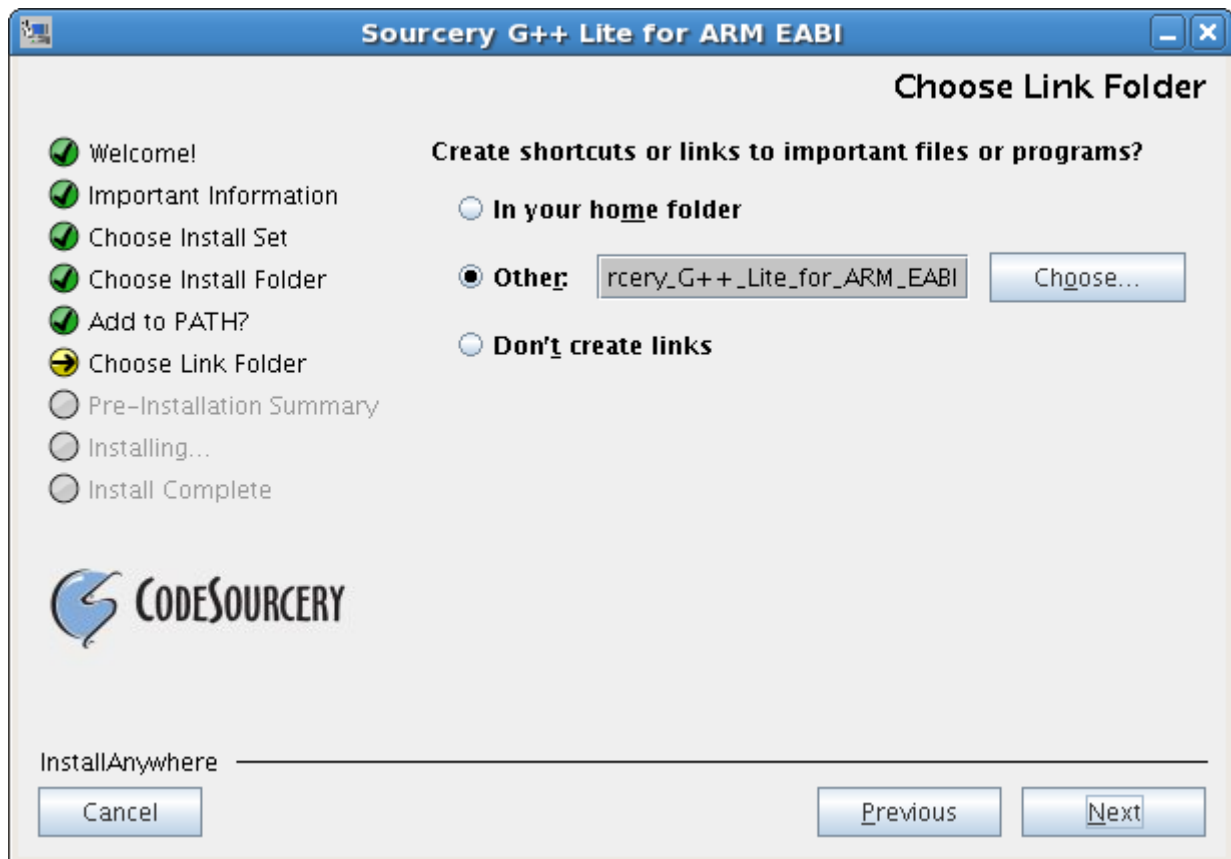
选择“Typical”，点击“Next”



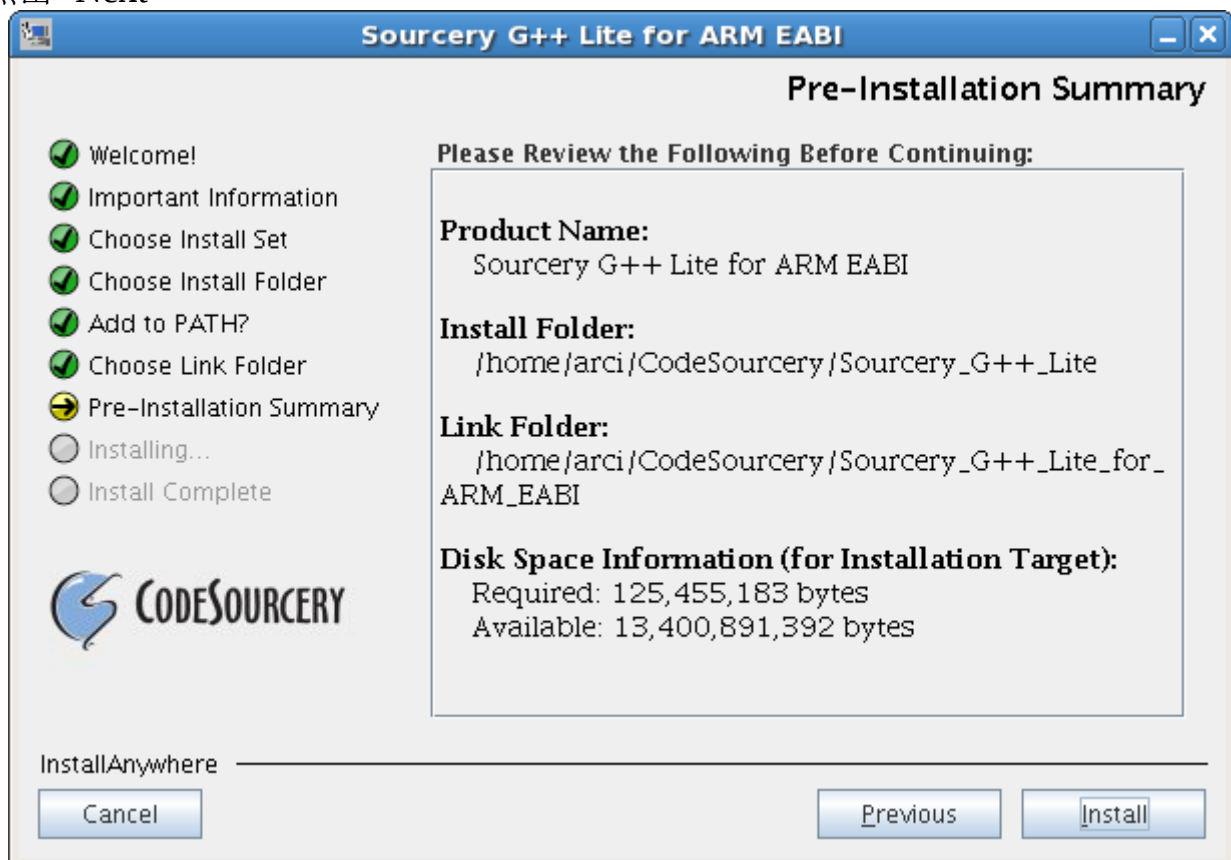
默认目录安装，直接点击“Next”



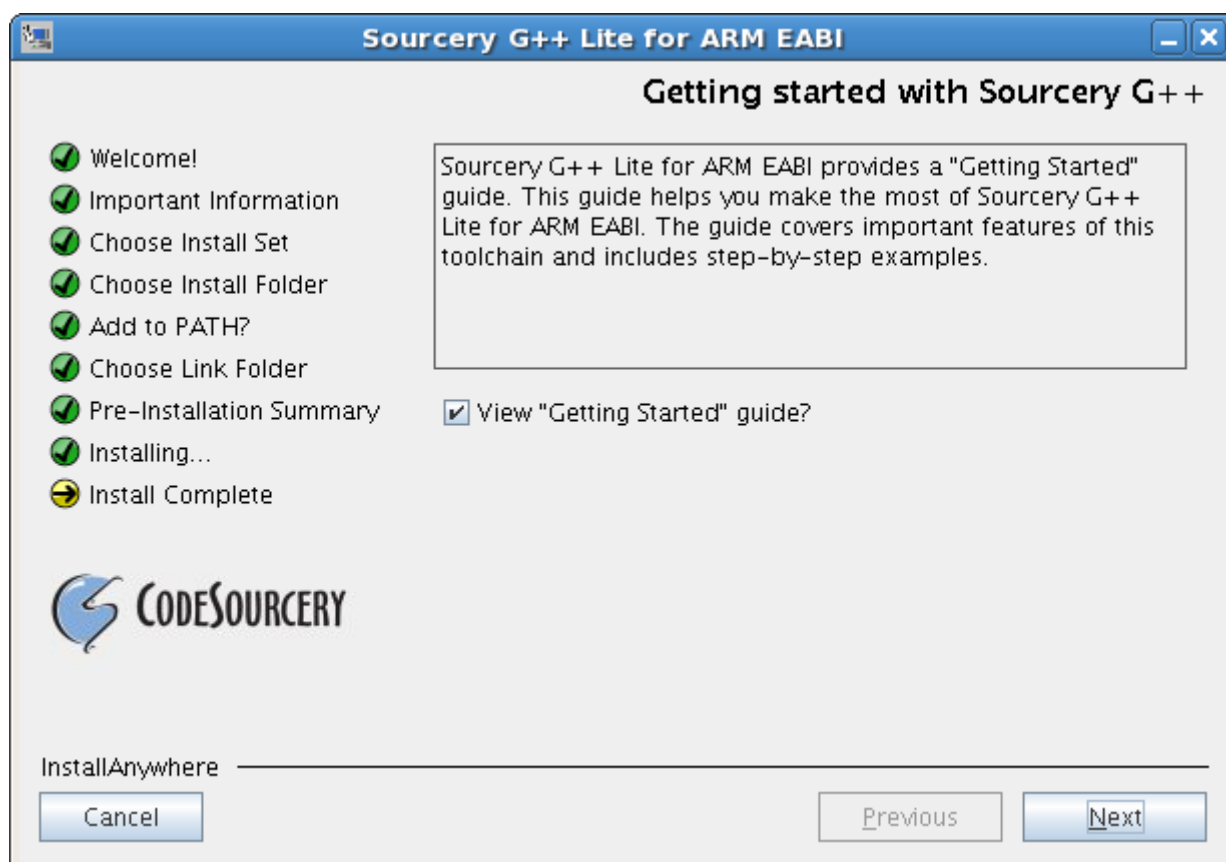
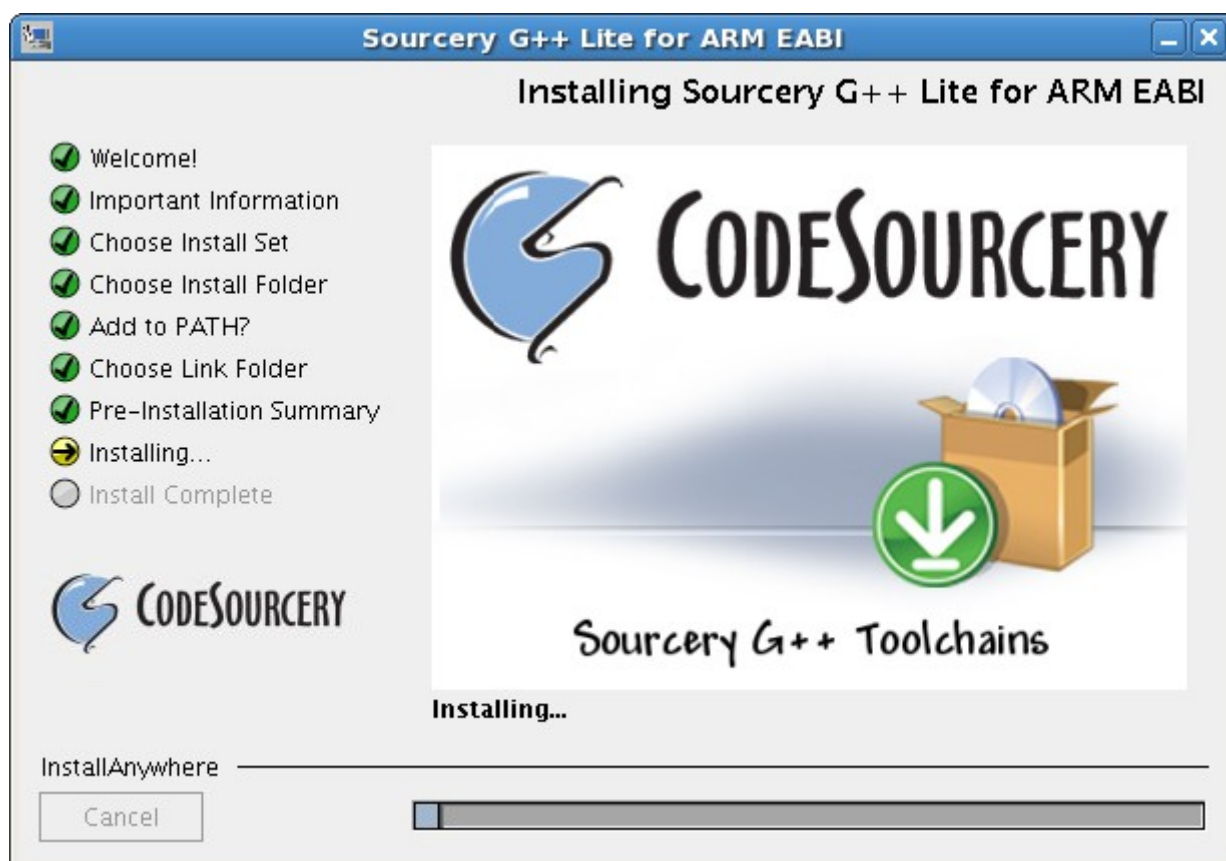
选择“Modify PATH for current user.”，为当前用户修改“PATH”环境变量，点击“Next”



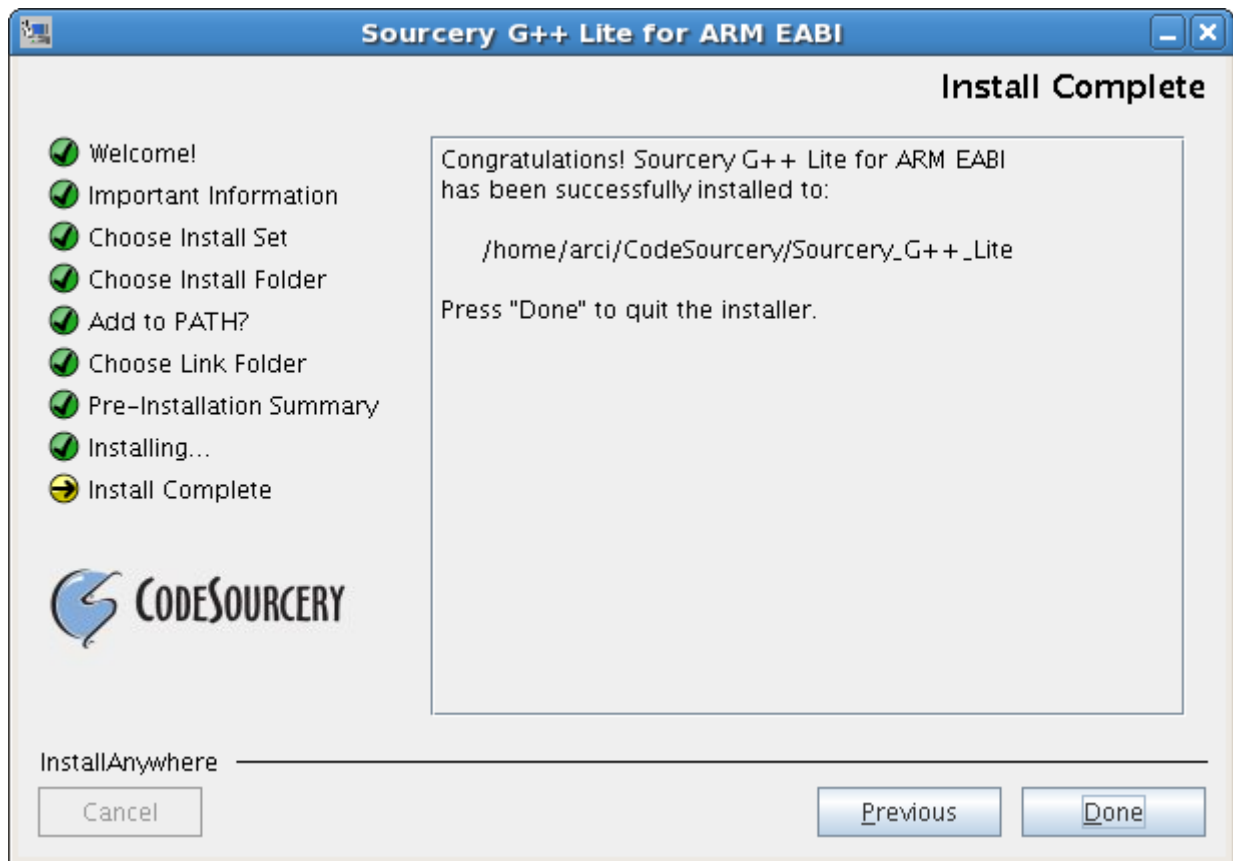
点击“Next”



点击“Install”

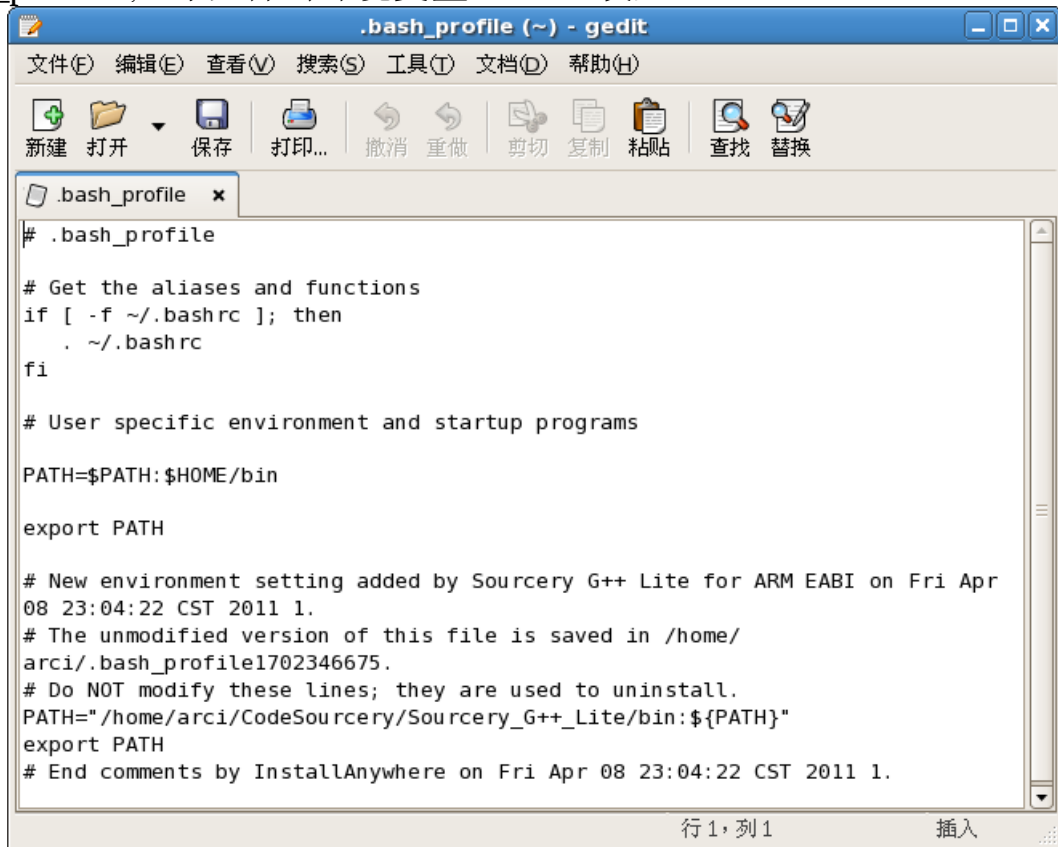


点击“Next”

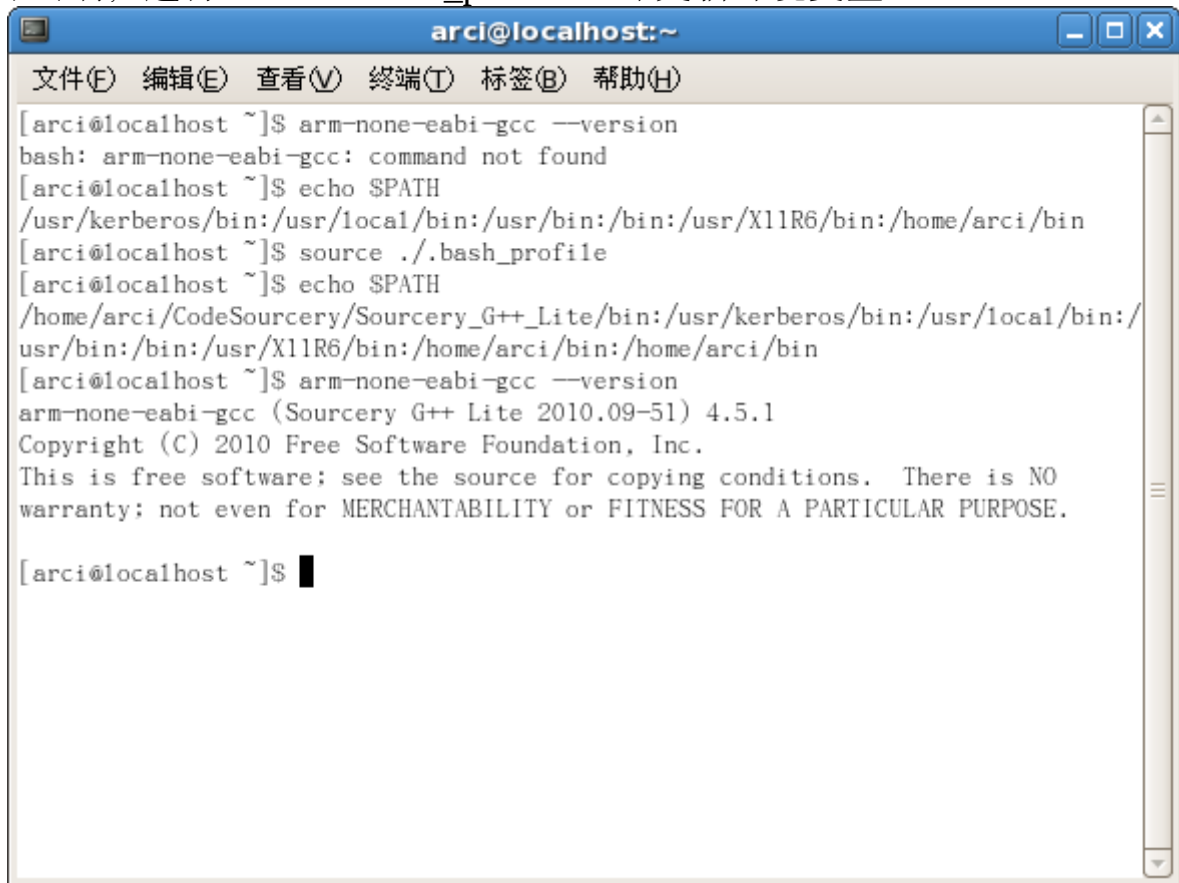


点击“Done”完成安装。

打开当前用户的主文件夹，点击“查看”——“显示隐藏文件”，打开文件“.bash_profile”，可以看到环境变量“PATH”设置



打开终端，运行“source ~/.bash_profile”立即更新环境变量。



```
arci@localhost:~  
文件(F) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)  
[arci@localhost ~]$ arm-none-eabi-gcc --version  
bash: arm-none-eabi-gcc: command not found  
[arci@localhost ~]$ echo $PATH  
/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/arci/bin  
[arci@localhost ~]$ source ~/.bash_profile  
[arci@localhost ~]$ echo $PATH  
/home/arci/CodeSourcery/Sourcery_G++_Lite/bin:/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/arci/bin:/home/arci/bin  
[arci@localhost ~]$ arm-none-eabi-gcc --version  
arm-none-eabi-gcc (Sourcery G++ Lite 2010.09-51) 4.5.1  
Copyright (C) 2010 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
[arci@localhost ~]$ █
```


3、eclipse 集成开发环境安装

Eclipse 是著名的跨平台的自由集成开发环境（IDE）。最初主要用来 Java 语言开发，但是目前亦有人通过插件使其作为 C++、Python、PHP 等其他语言的开发工具。

Eclipse 的本身只是一个框架平台，但是众多插件的支持，使得 Eclipse 拥有较佳的灵活性。许多软件开发商以 Eclipse 为框架开发自己的 IDE。

3.1、安装 Eclipse IDE for C/C++ Developers

下载 Eclipse IDE for C/C++ Developers

The screenshot shows the Eclipse Downloads page in a Mozilla Firefox browser window. The browser's address bar shows the URL <http://www.eclipse.org/downloads/>. The page features the Eclipse logo and a navigation menu with links for Home, Downloads, Users, Members, Committers, Resources, Projects, and About Us. A search bar is also present.

The main content area is titled "Eclipse Downloads" and includes tabs for Packages, Developer Builds, and Projects. Under the "Packages" tab, there are several download options for Eclipse Helios (3.6.2) on Linux:

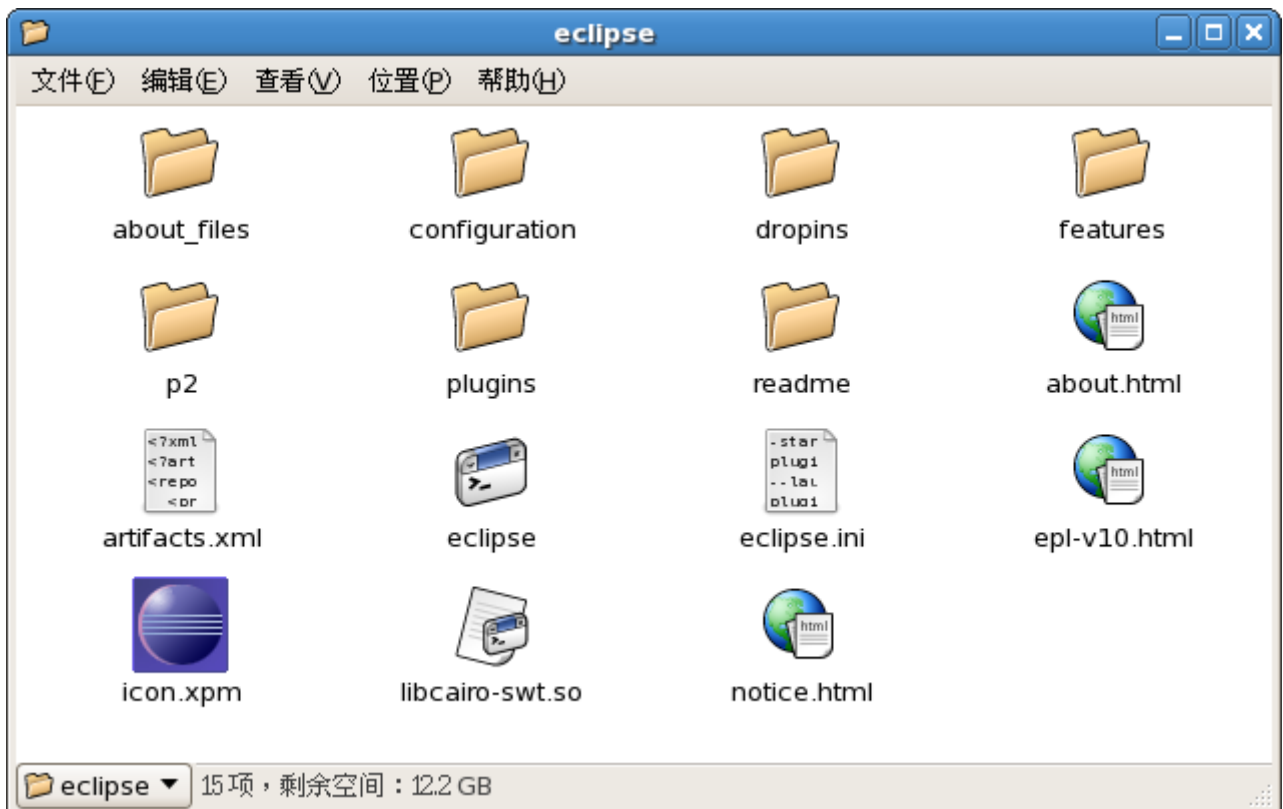
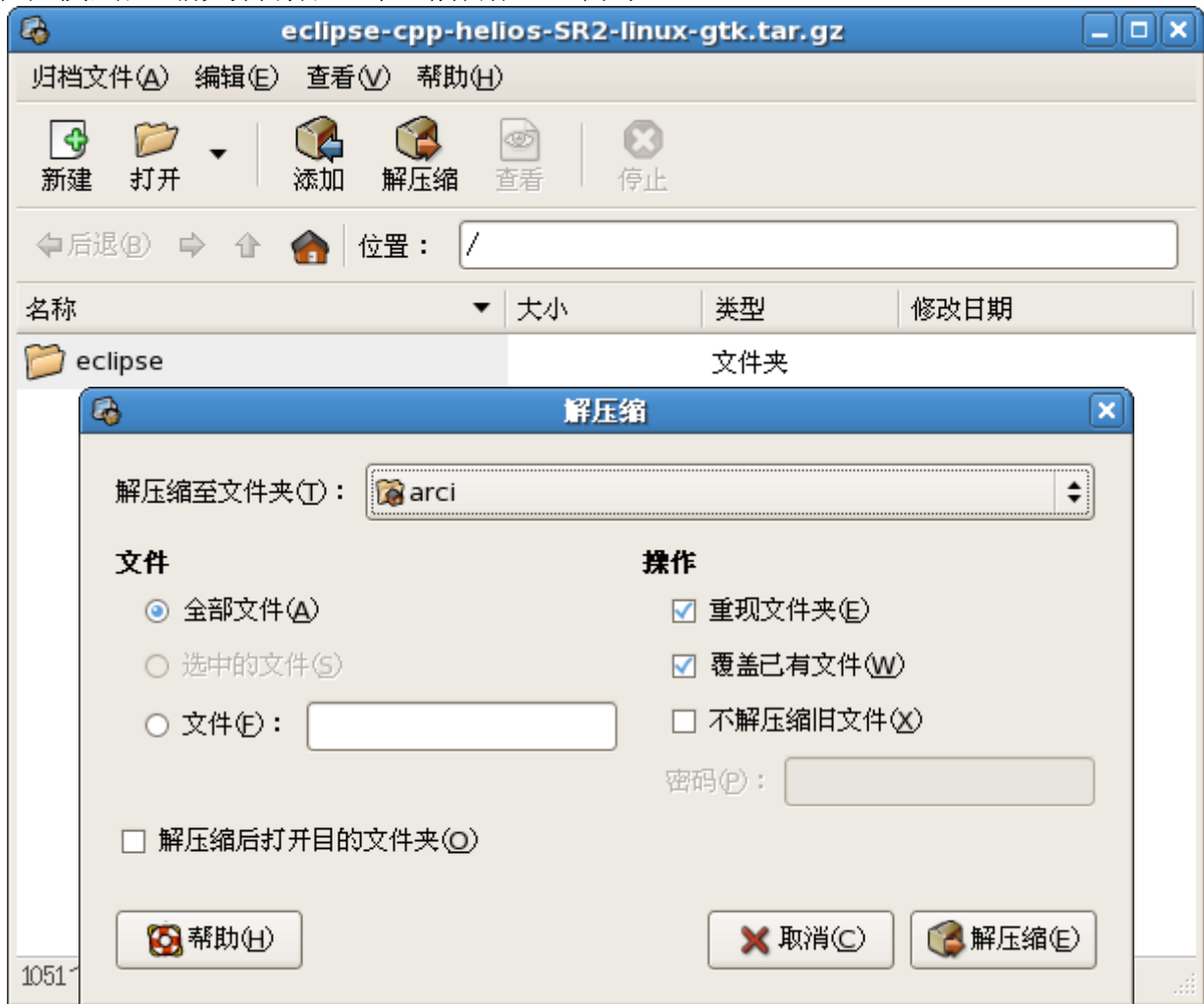
- Eclipse IDE for Java Developers**, 98 MB, Downloaded 743,848 Times. Download links for Linux 32 Bit and Linux 64 Bit.
- Eclipse IDE for Java EE Developers**, 205 MB, Downloaded 596,605 Times. Download links for Linux 32 Bit and Linux 64 Bit.
- Eclipse Classic 3.6.2**, 170 MB, Downloaded 506,741 Times. Download links for Linux 32 Bit and Linux 64 Bit.
- Google Plugin for Eclipse**, Promoted Download. Download link.
- Eclipse IDE for C/C++ Developers**, 87 MB, Downloaded 188,041 Times. Download links for Linux 32 Bit and Linux 64 Bit.

A "Hint:" section on the right side of the page states: "You will need a Java runtime environment (JRE) to use Eclipse (Java SE 5 or greater is recommended). All downloads are provided under the terms and conditions of the Eclipse Foundation Software User Agreement unless otherwise specified."

At the bottom of the page, there is an advertisement for "The Easiest Way To Define Your Own Modeling Tools" featuring a woman and the name "Obeo".

The browser's status bar at the bottom shows the full URL: <http://www.eclipse.org/downloads/packages/eclipse-ide-cc-developers/heliosr2>

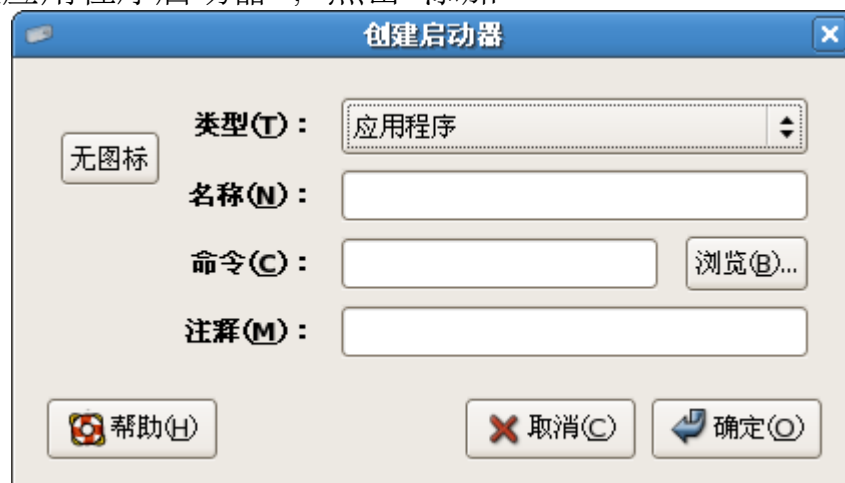
将下载的压缩文件解压到当前用户主目录



将 eclipse 添加到面板



选择“自定义应用程序启动器”，点击“添加”



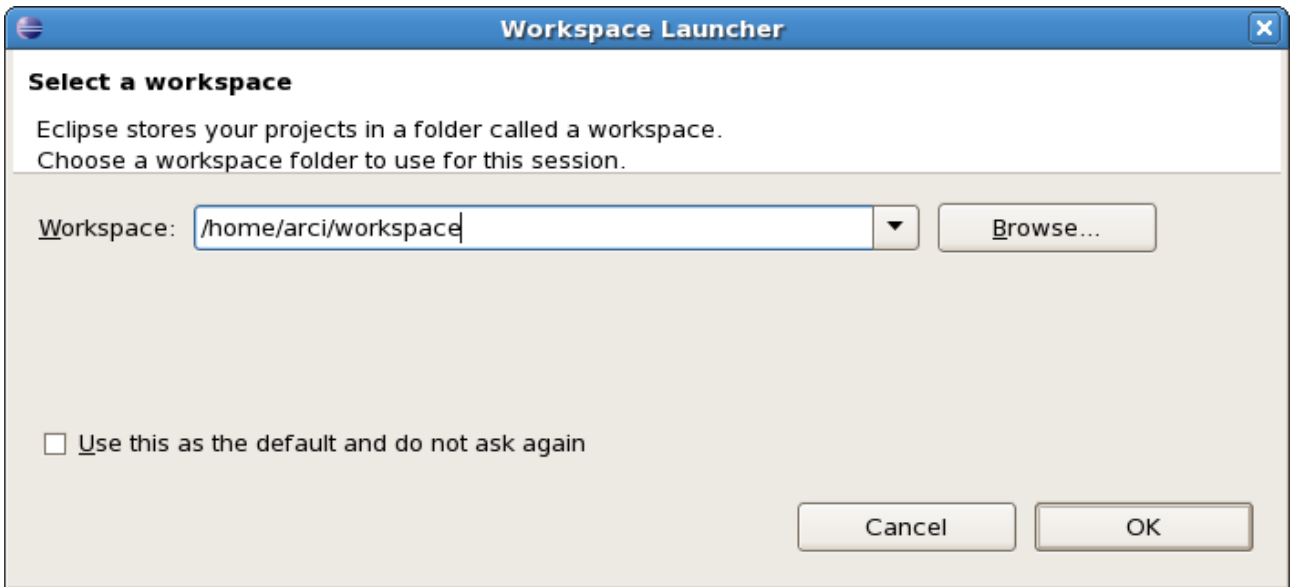


填写“名称”，选择“命令”和“图标”，点击“确定”

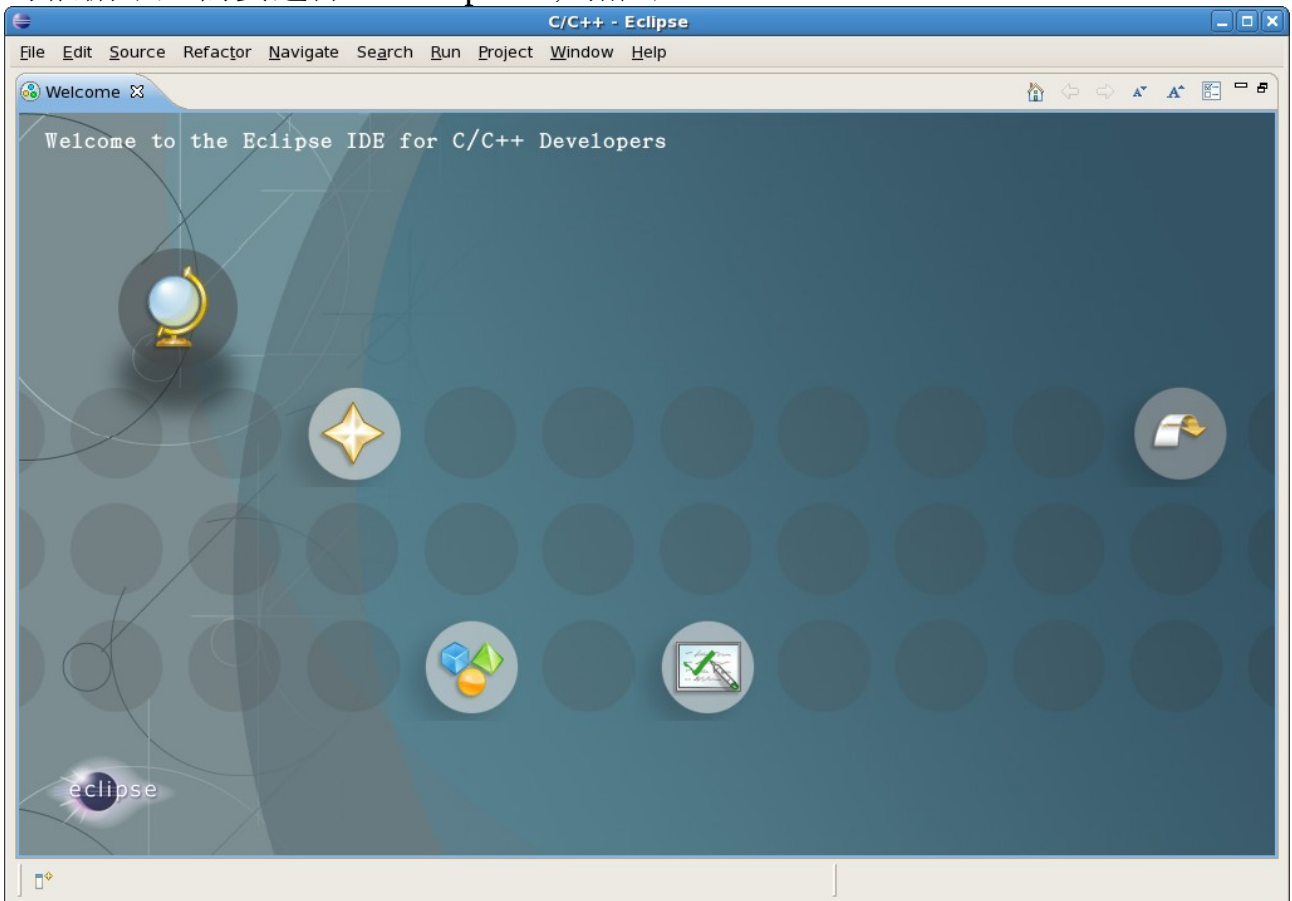


点击“eclipse”图标，启动 eclipse



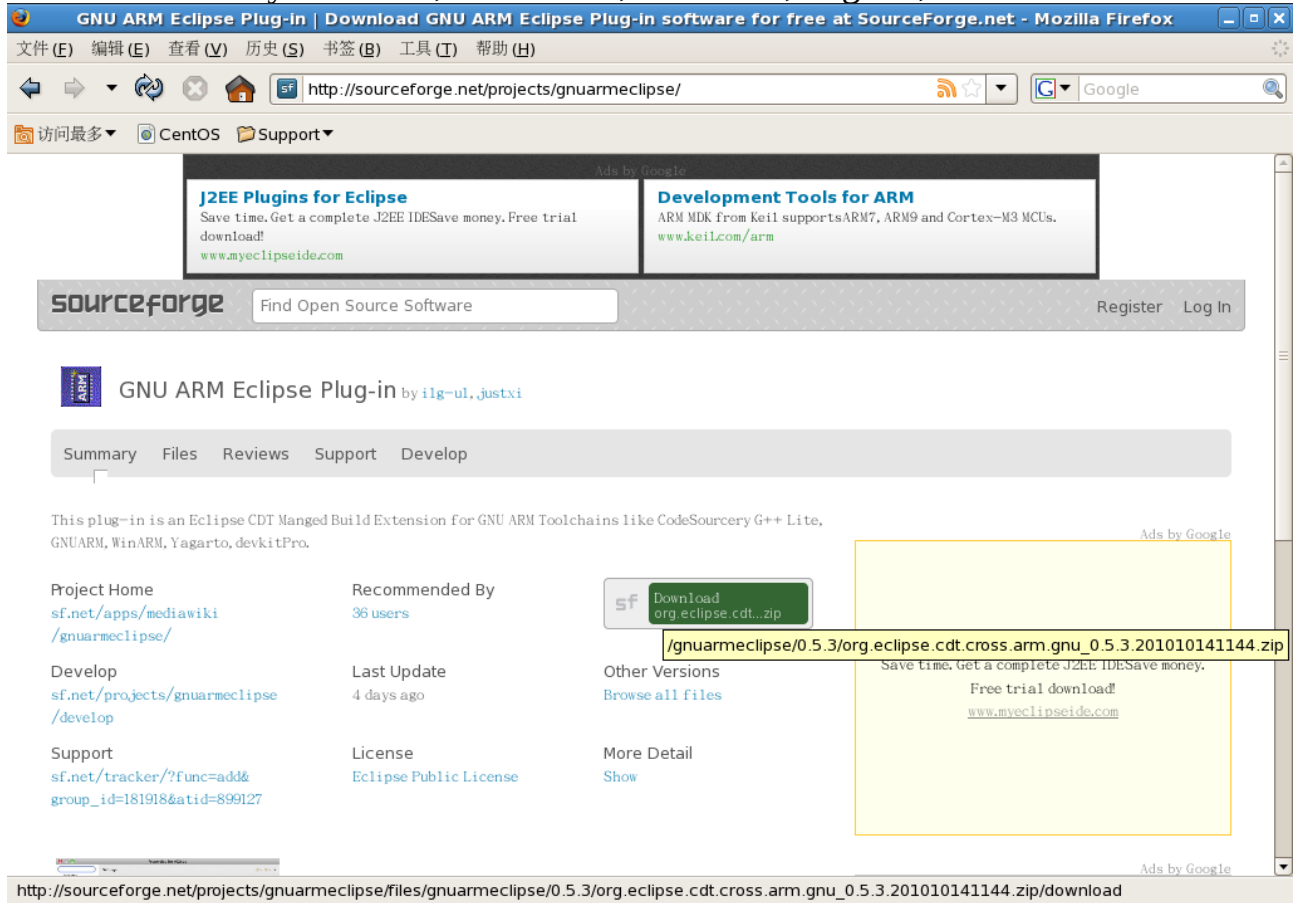


可根据个人需要选择“Workspace”，点击“OK”

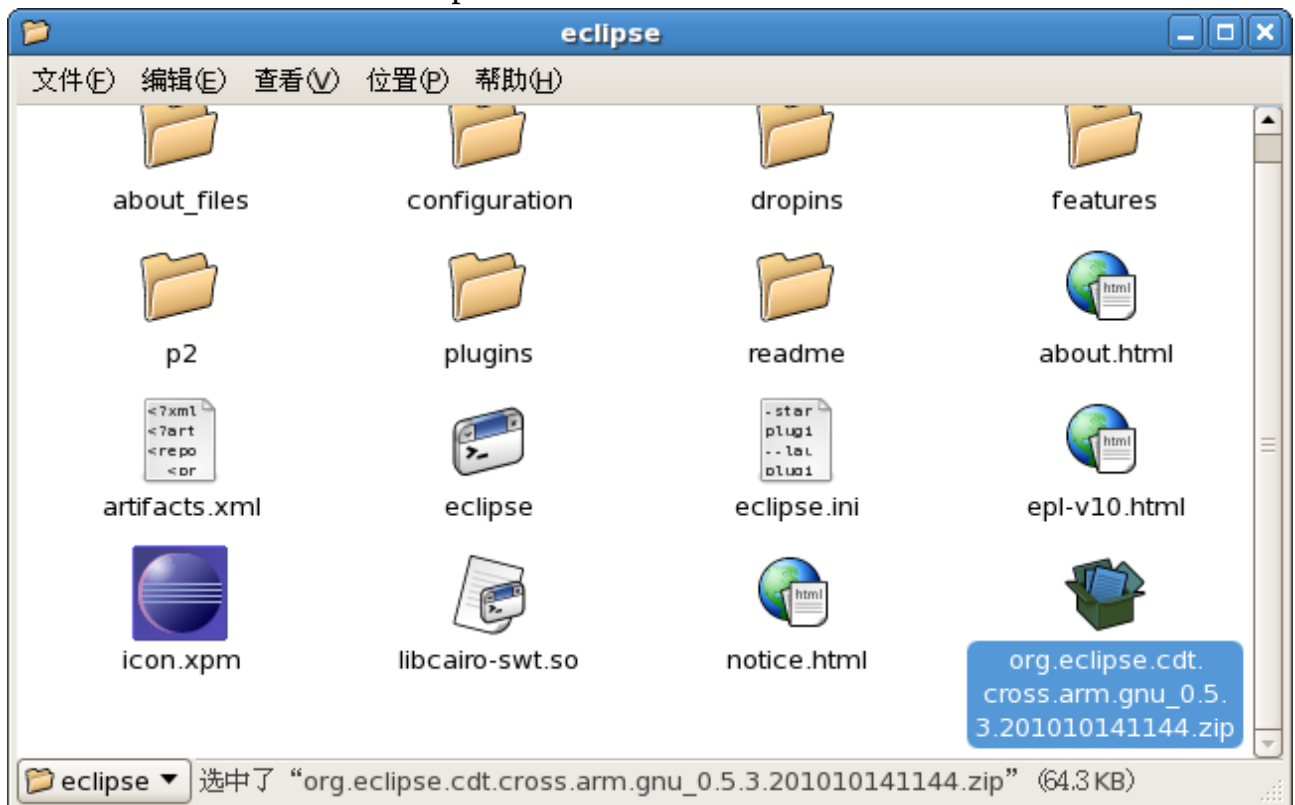


3.2、安装 GNU ARM Eclipse Plug-in

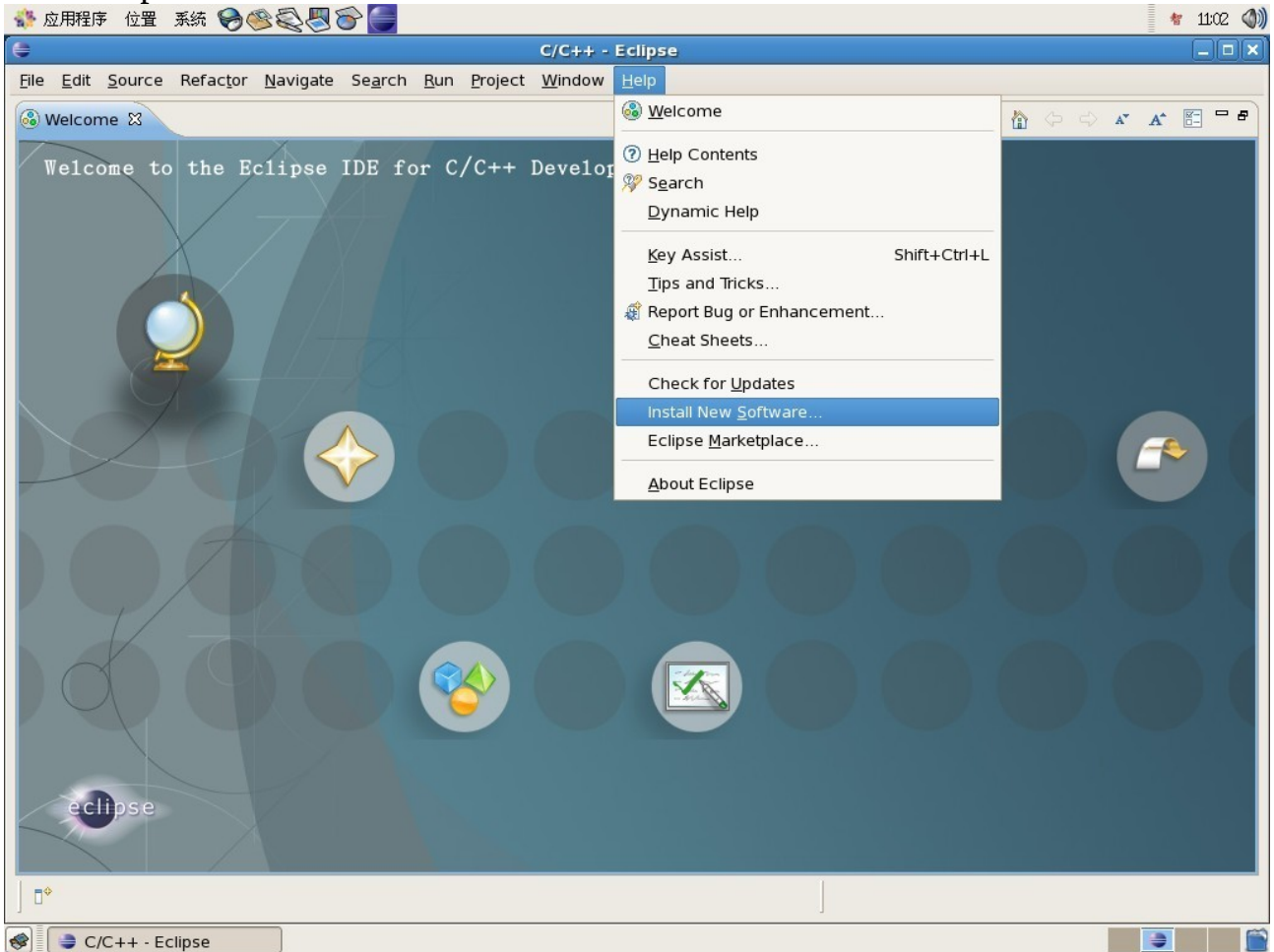
This plug-in is an Eclipse CDT Manged Build Extension for GNU ARM Toolchains like CodeSourcery G++ Lite, GNUARM, WinARM, Yagarto, devkitPro.



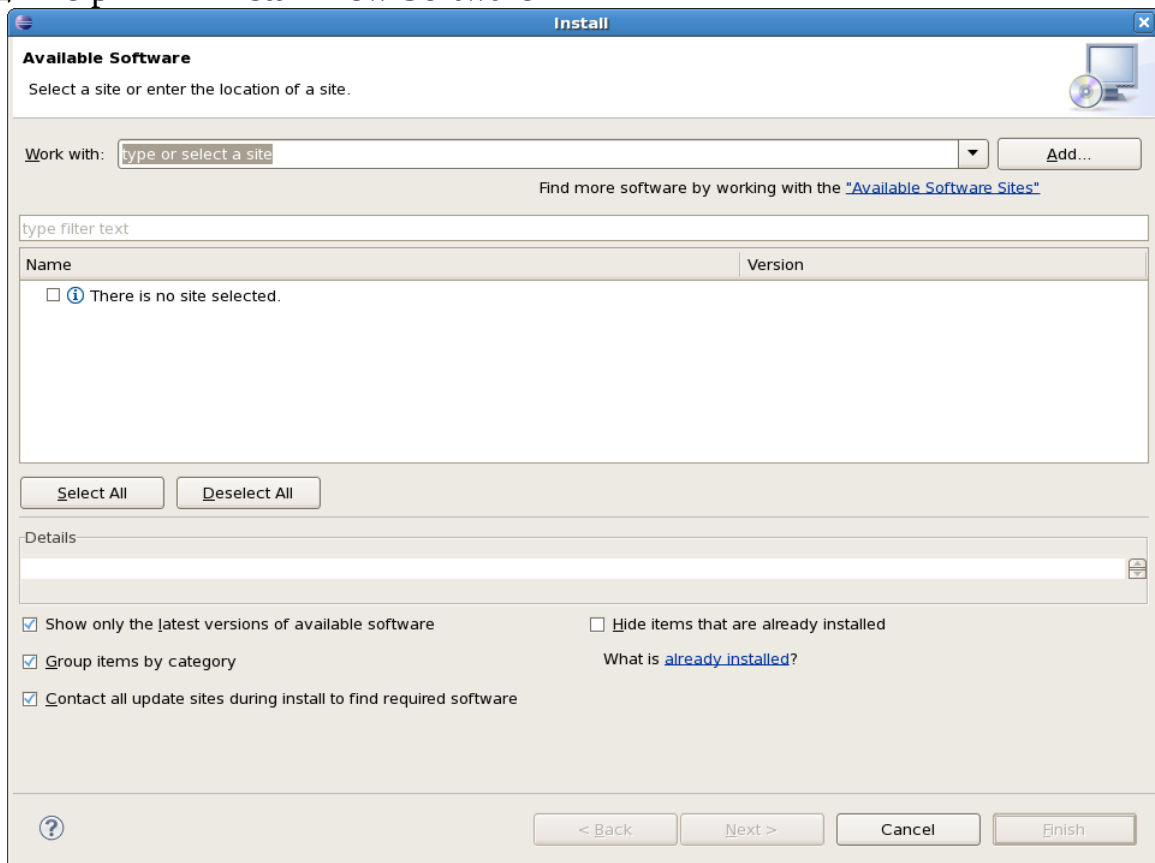
将下载的压缩文件放到 eclipse 安装目录下，不需要解压



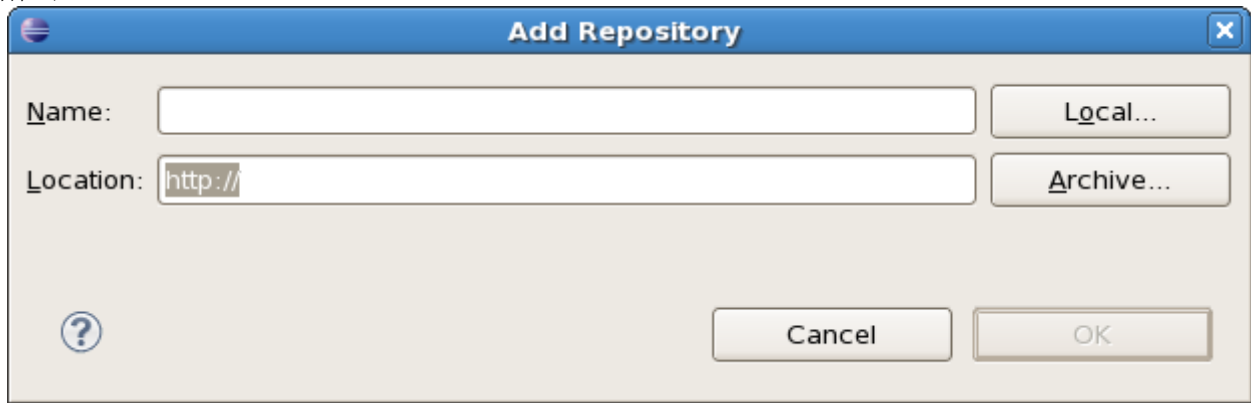
运行 eclipse,



点击“Help”——“Install New Software”



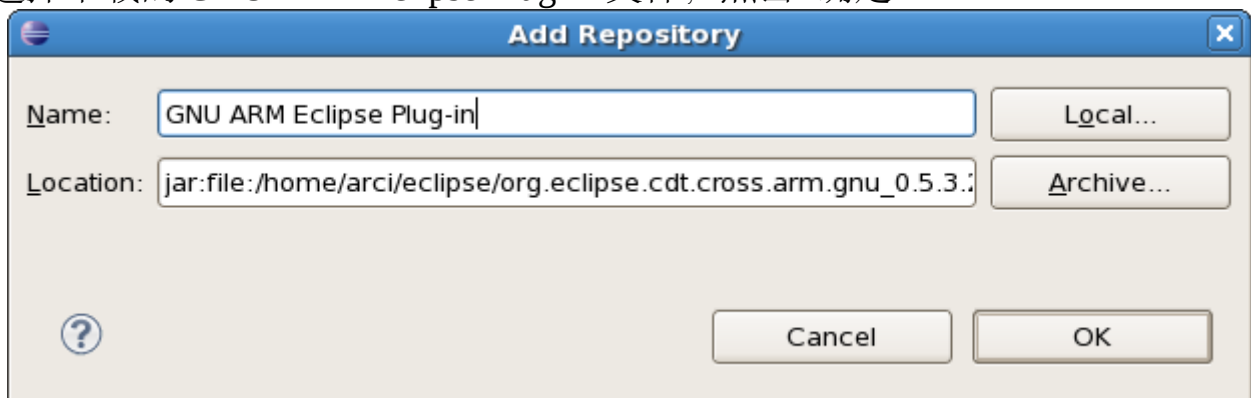
点击"Add"



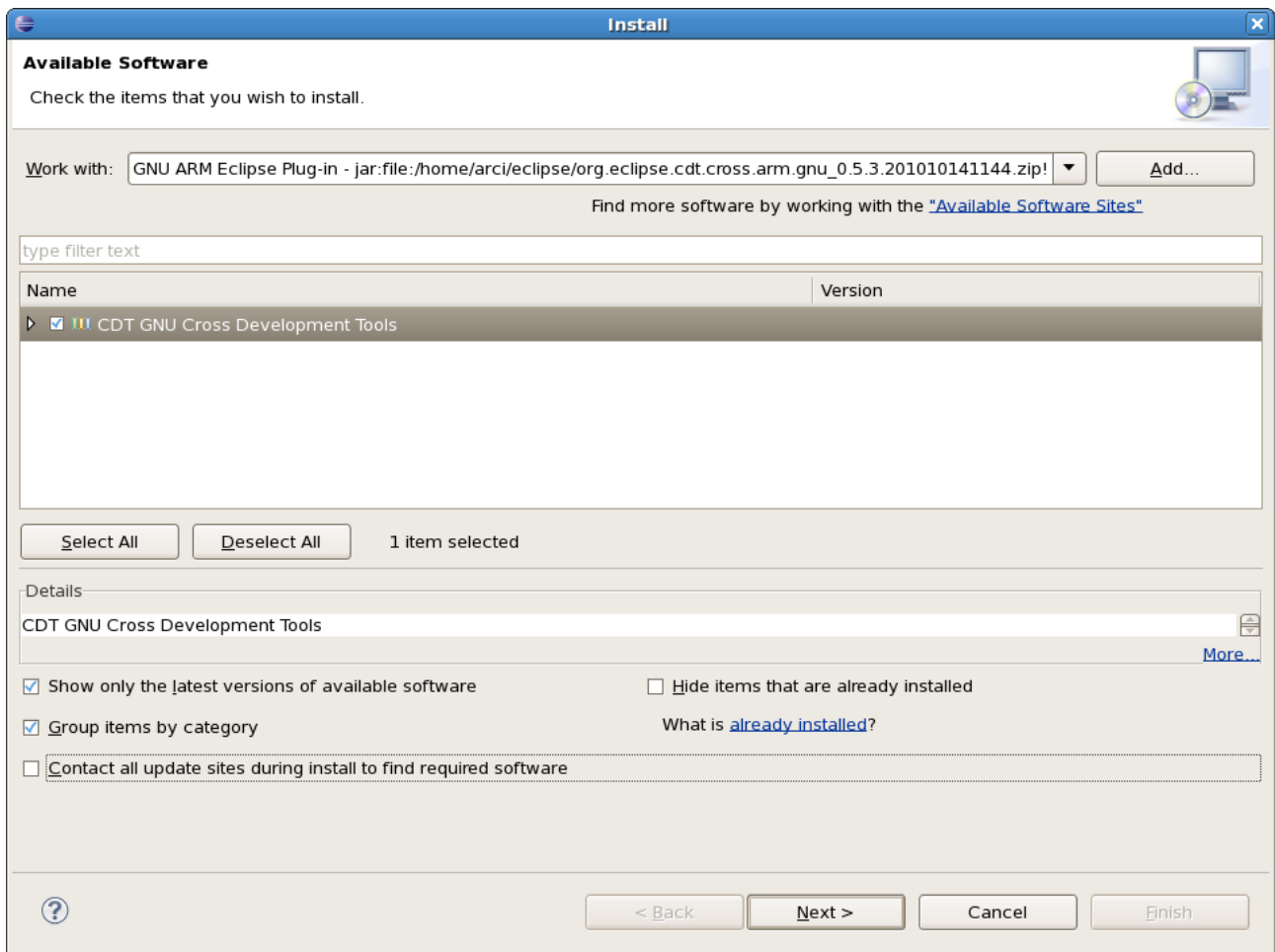
点击"Archive"



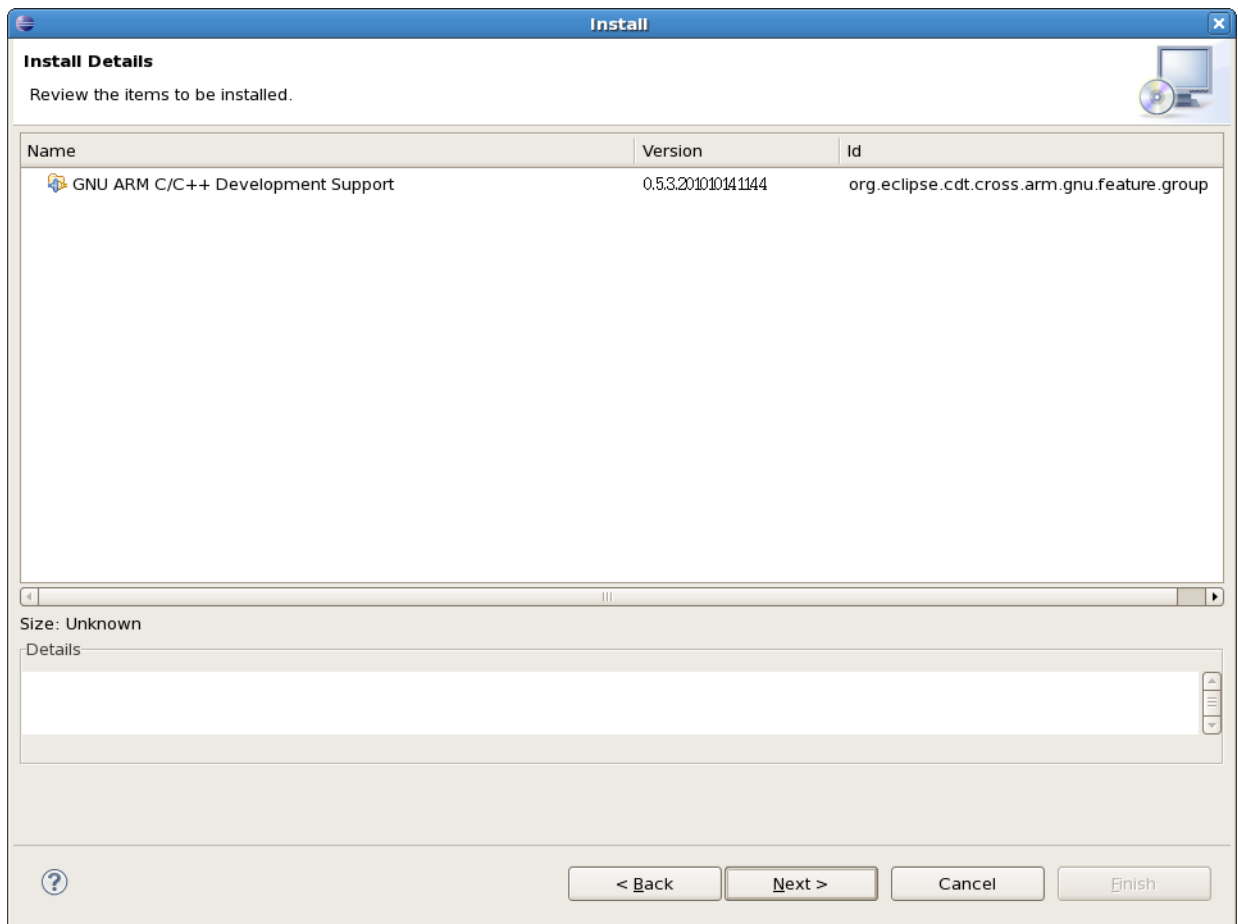
选择下载的 GNU ARM Eclipse Plug-in 文件，点击"确定"



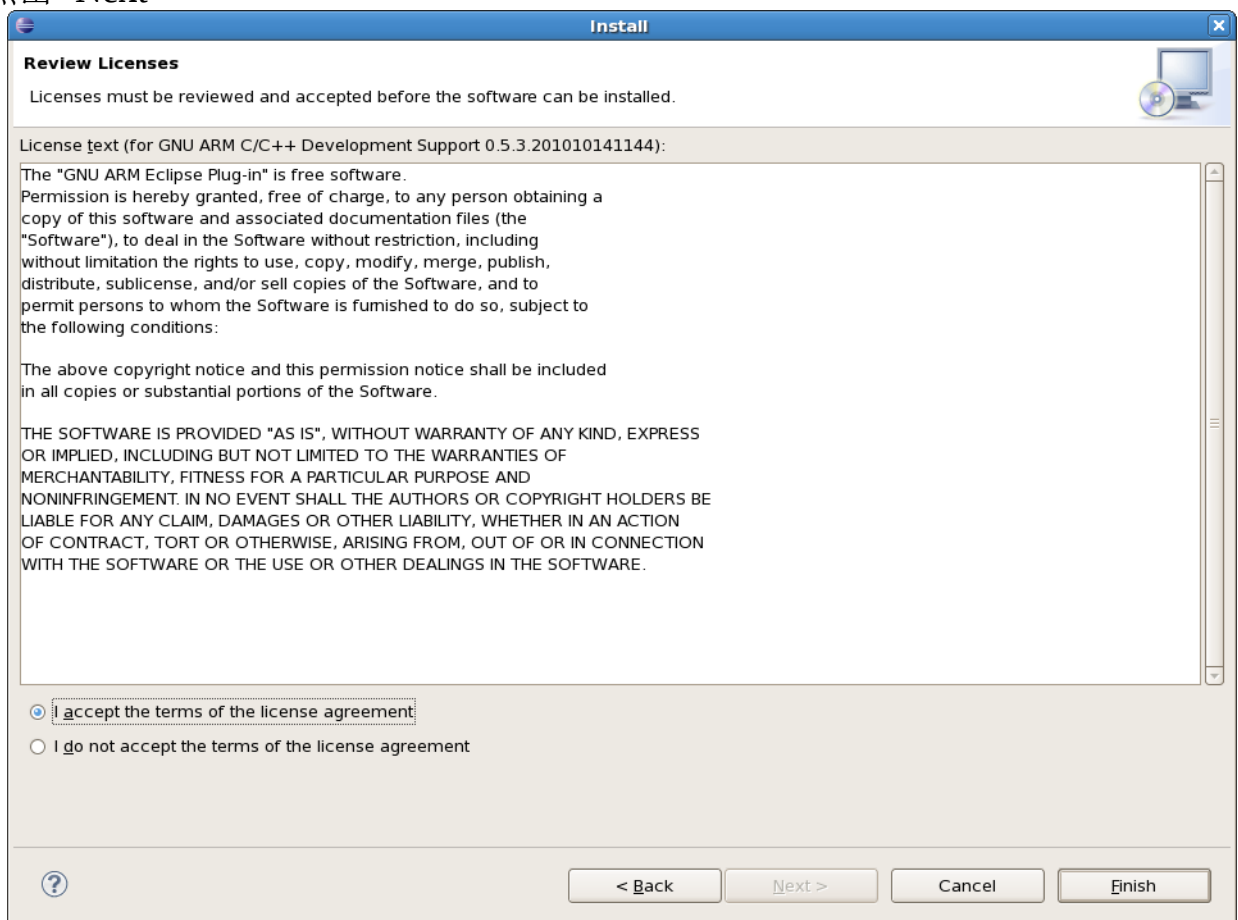
点击"OK"



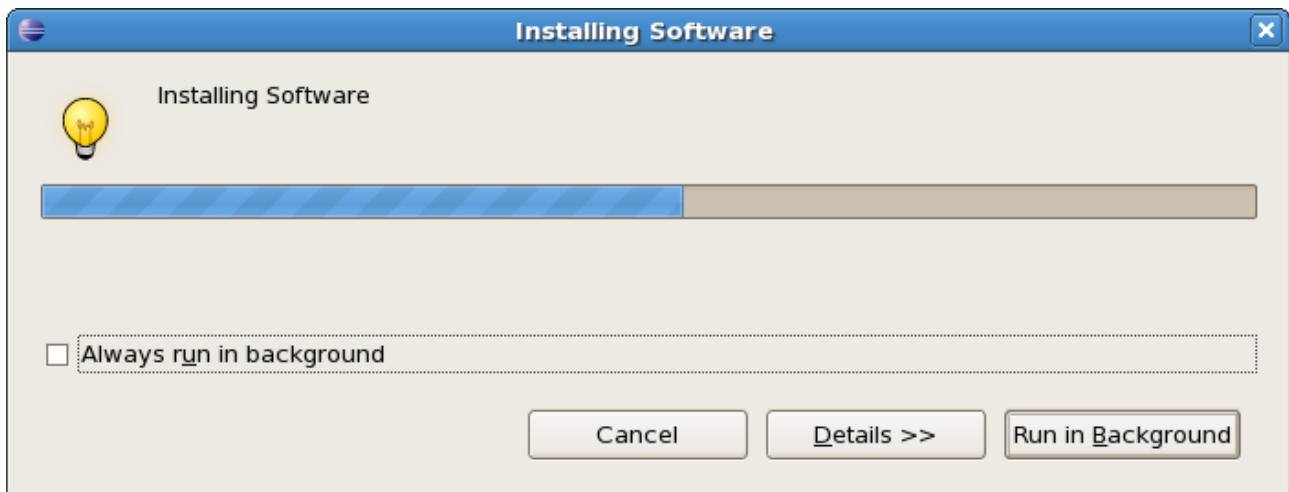
选中“CDT GNU Cross Development Tools”，取消选择“Contact all update sites during install to find required software”，点击“Next”



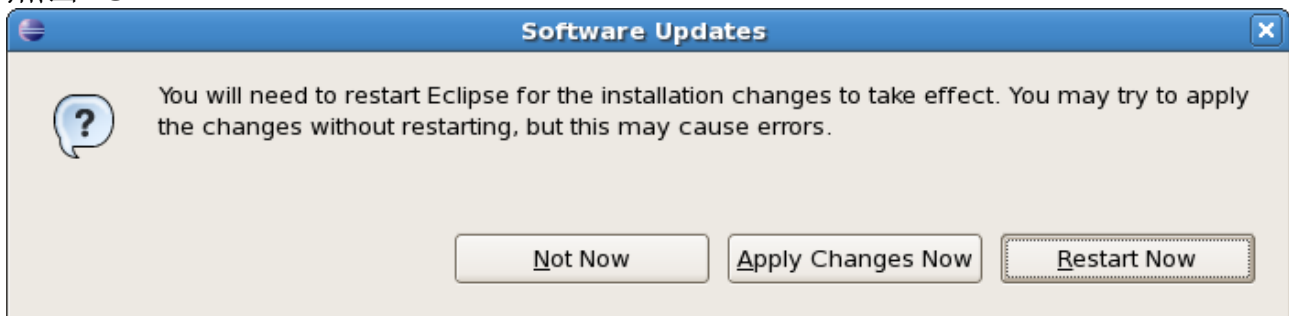
点击“Next”



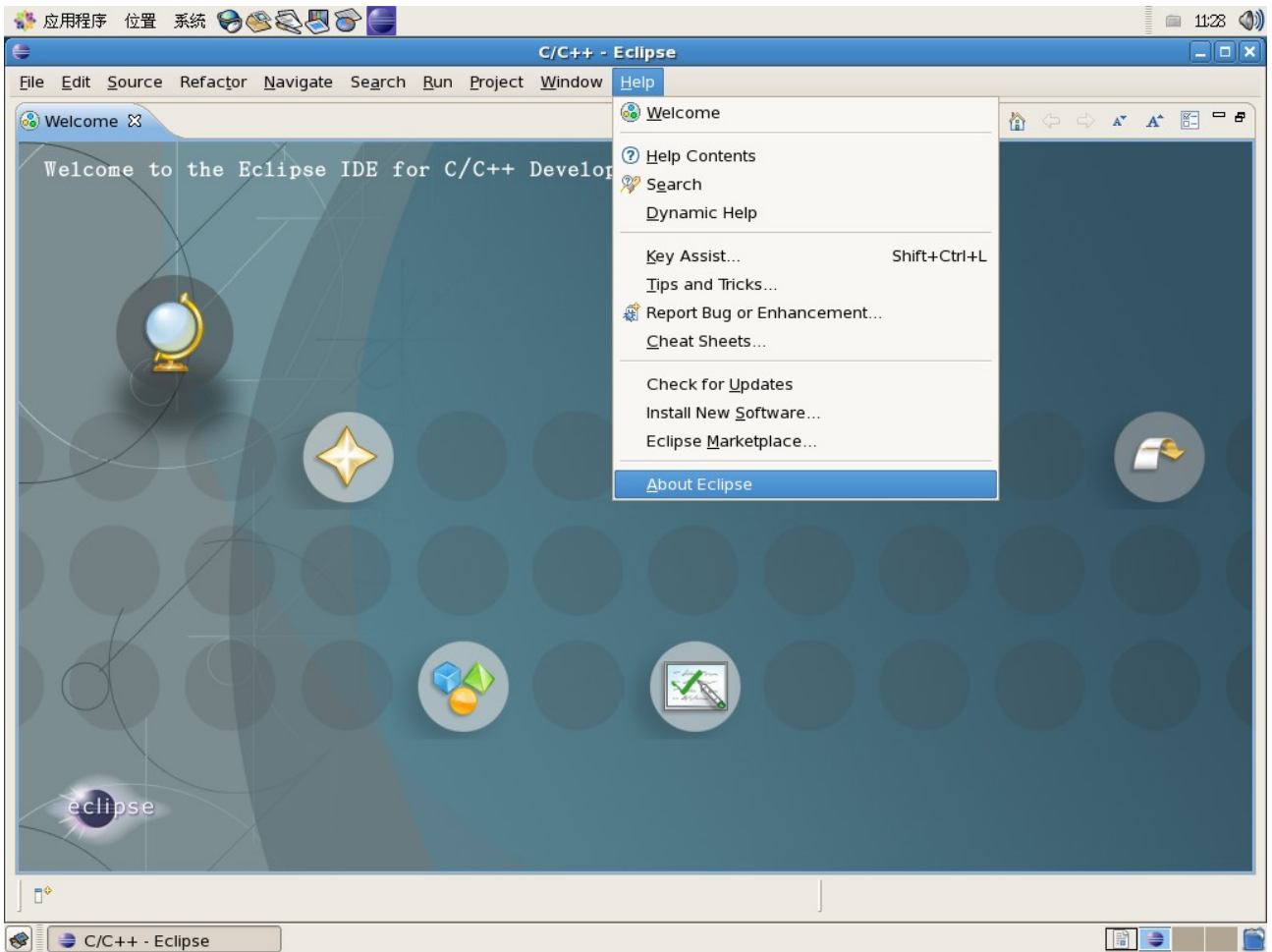
选择“I accept the terms or the license agreement”，点击“Finish”



点击“OK”



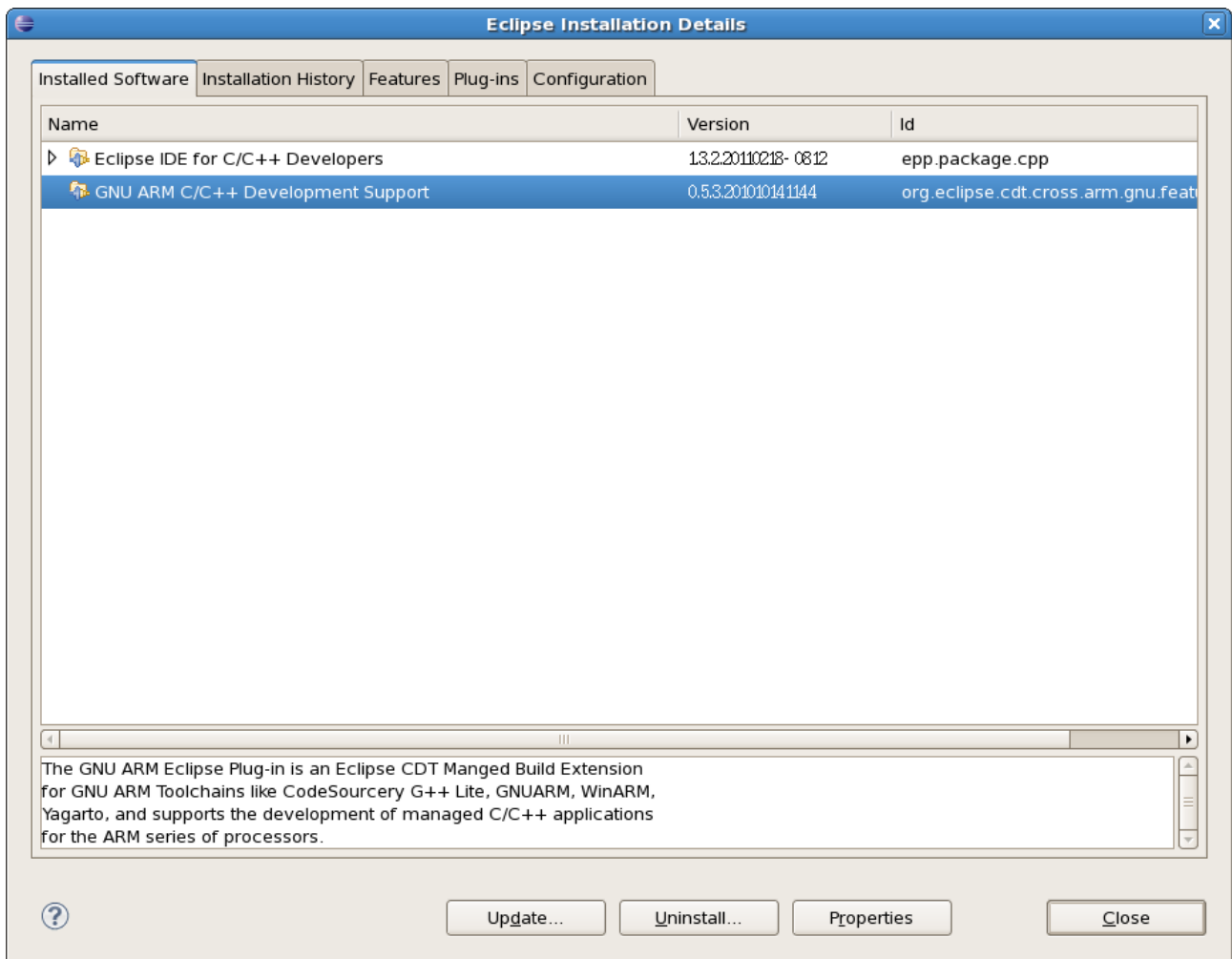
点击“Restart Now”



点击“Help”——“About Eclipse”



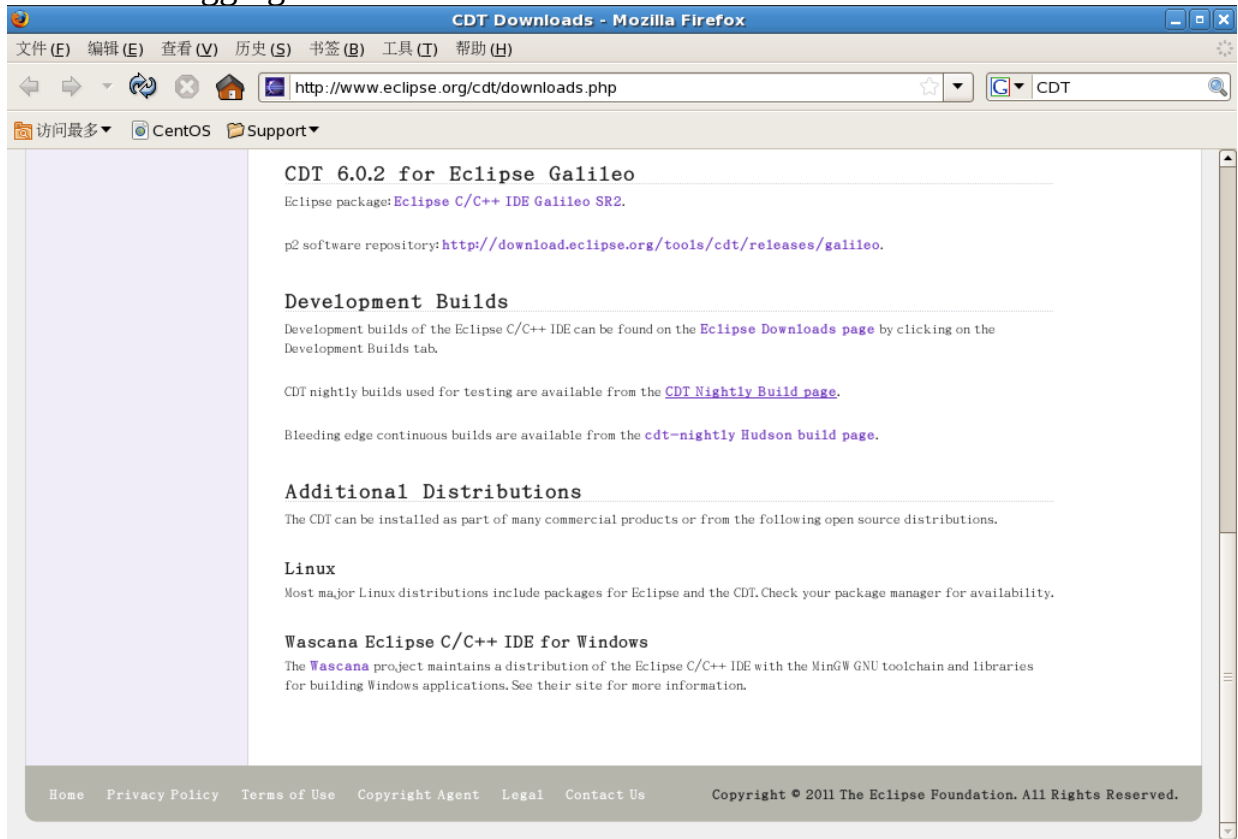
点击“Installation Details”



选择“GNU ARM C/C++ Development Support”，可点击“Uninstall”进行卸载
GNU ARM Eclipse Plug-in 安装完成。

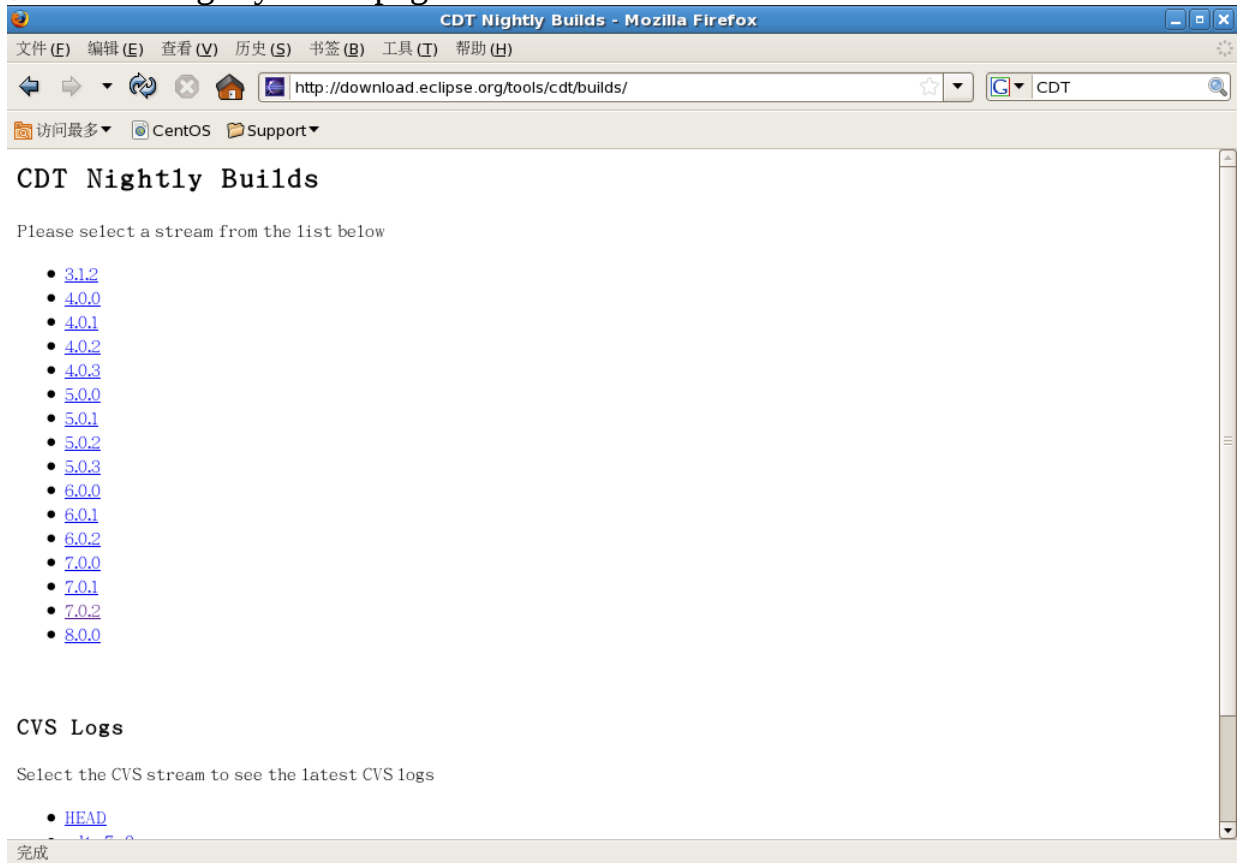
3.3、安装 GDB Hardware Debugging

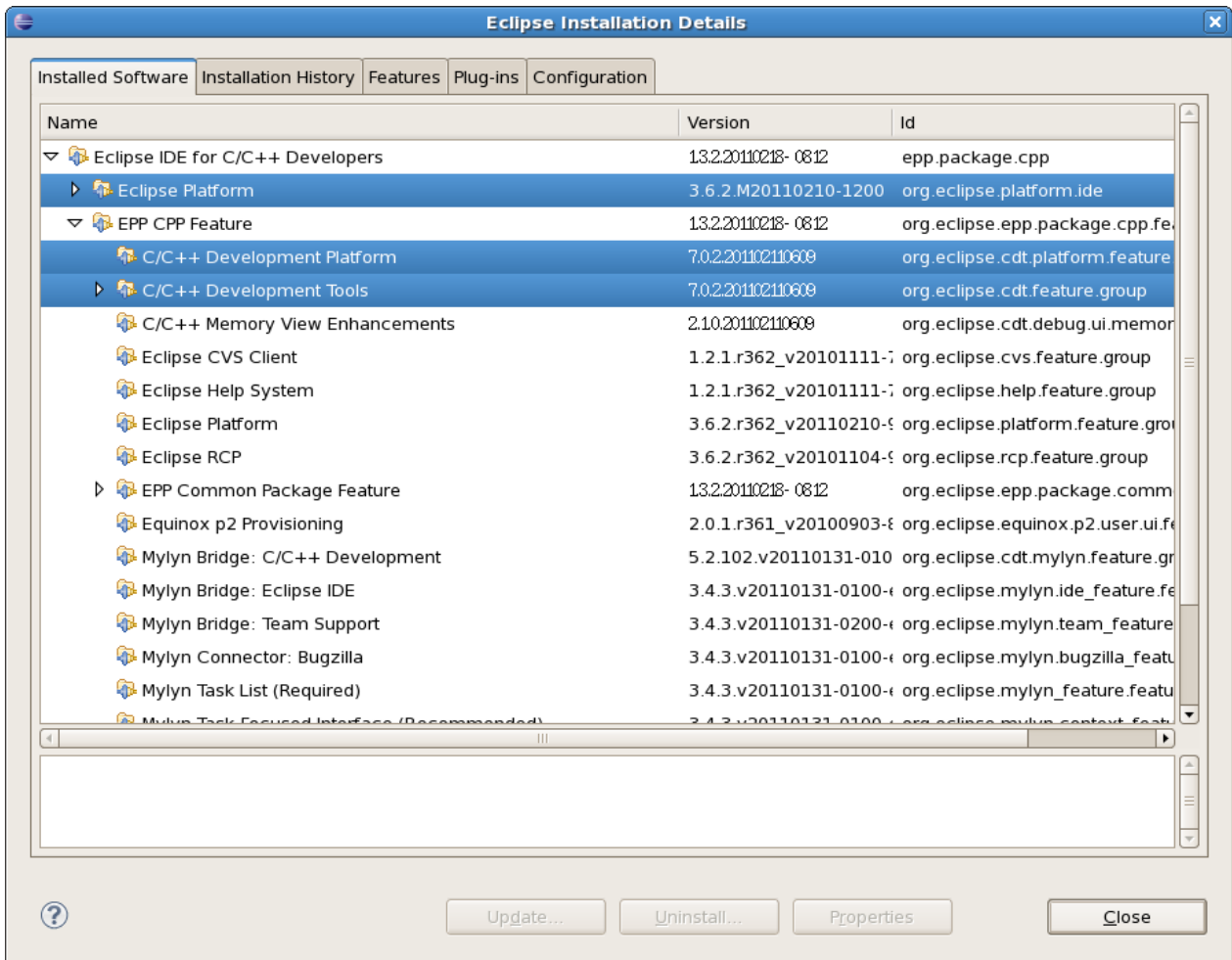
GDB Hardware Debugging - provides a launch configuration for launching gdb to do hardware debugging.



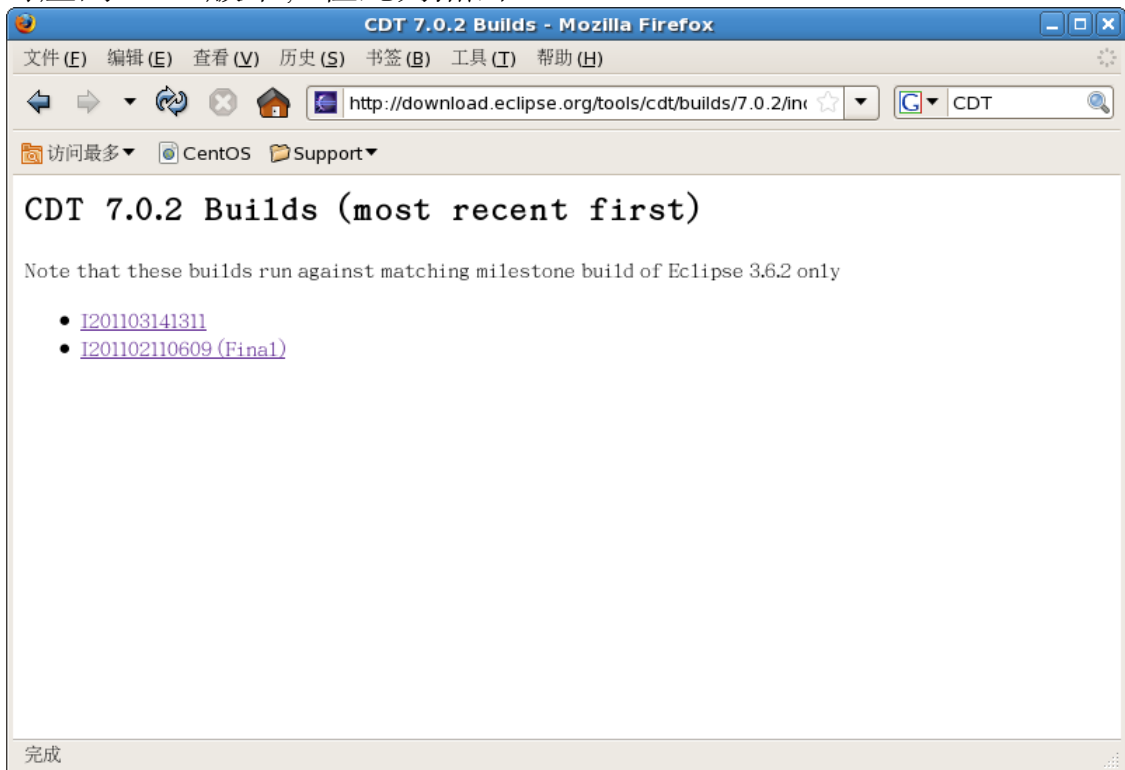
<http://download.eclipse.org/tools/cdt/builds>

点击“CDT Nightly Build page”

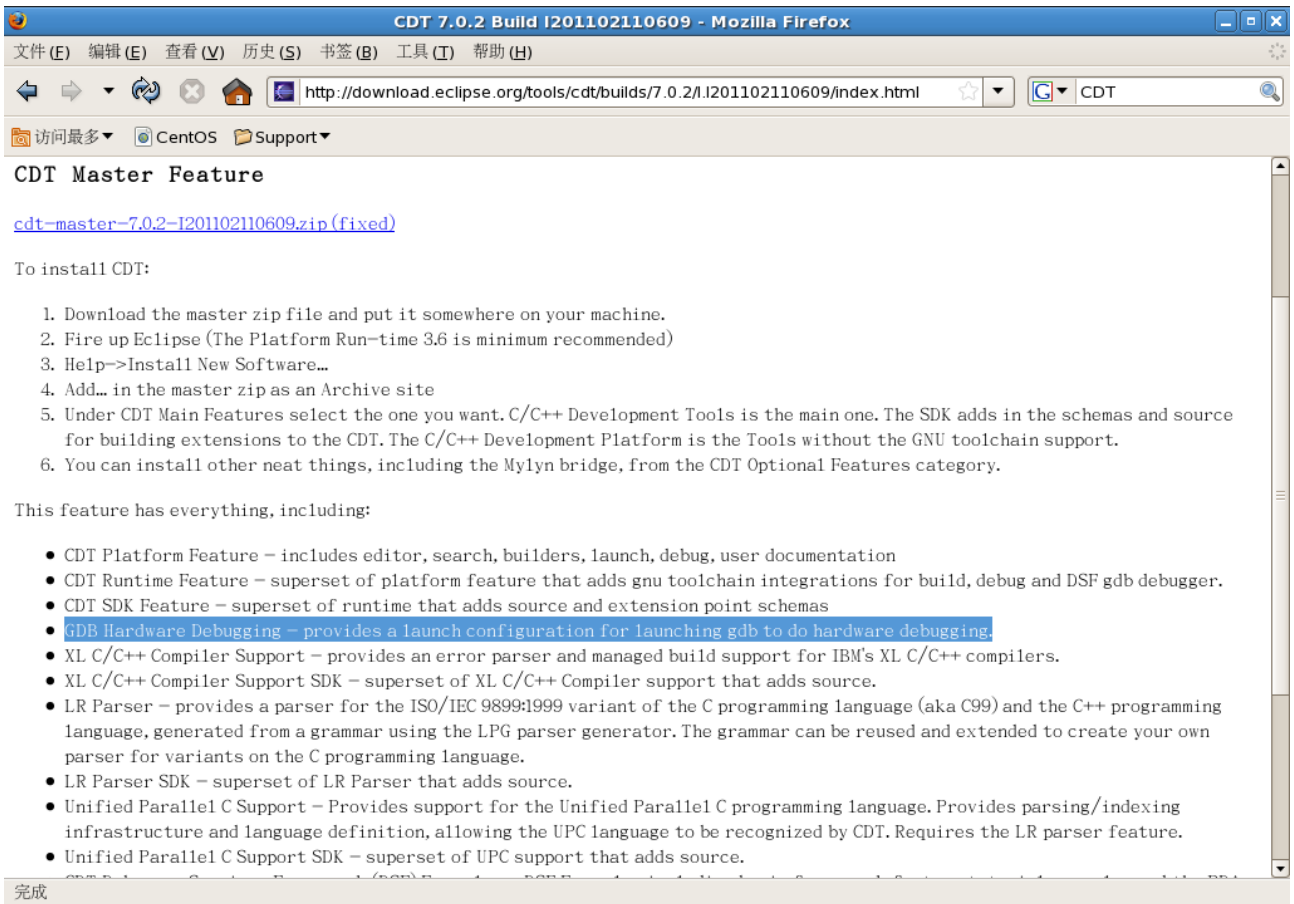




可在“eclipse”——“Help”——“About Eclipse”——“Installation Details”中查看“Eclipse”和“CDT”版本。
选择对应的CDT版本，在此为点击“7.0.2”



选择对应版本，点击“I201102110609 (Final)”

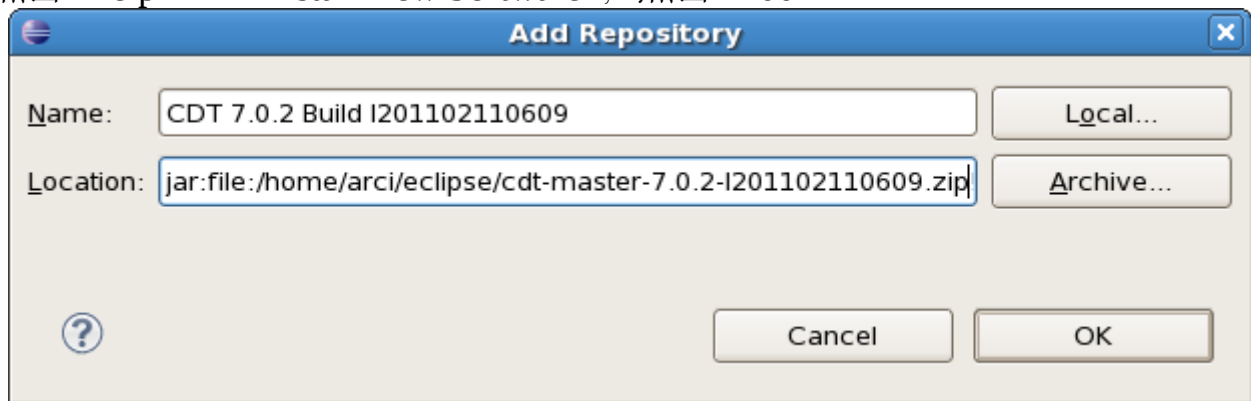


点击“[cdt-master-7.0.2-I201102110609.zip \(fixed\)](#)”下载
将下载的压缩文件放到 eclipse 安装目录下，不需要解压

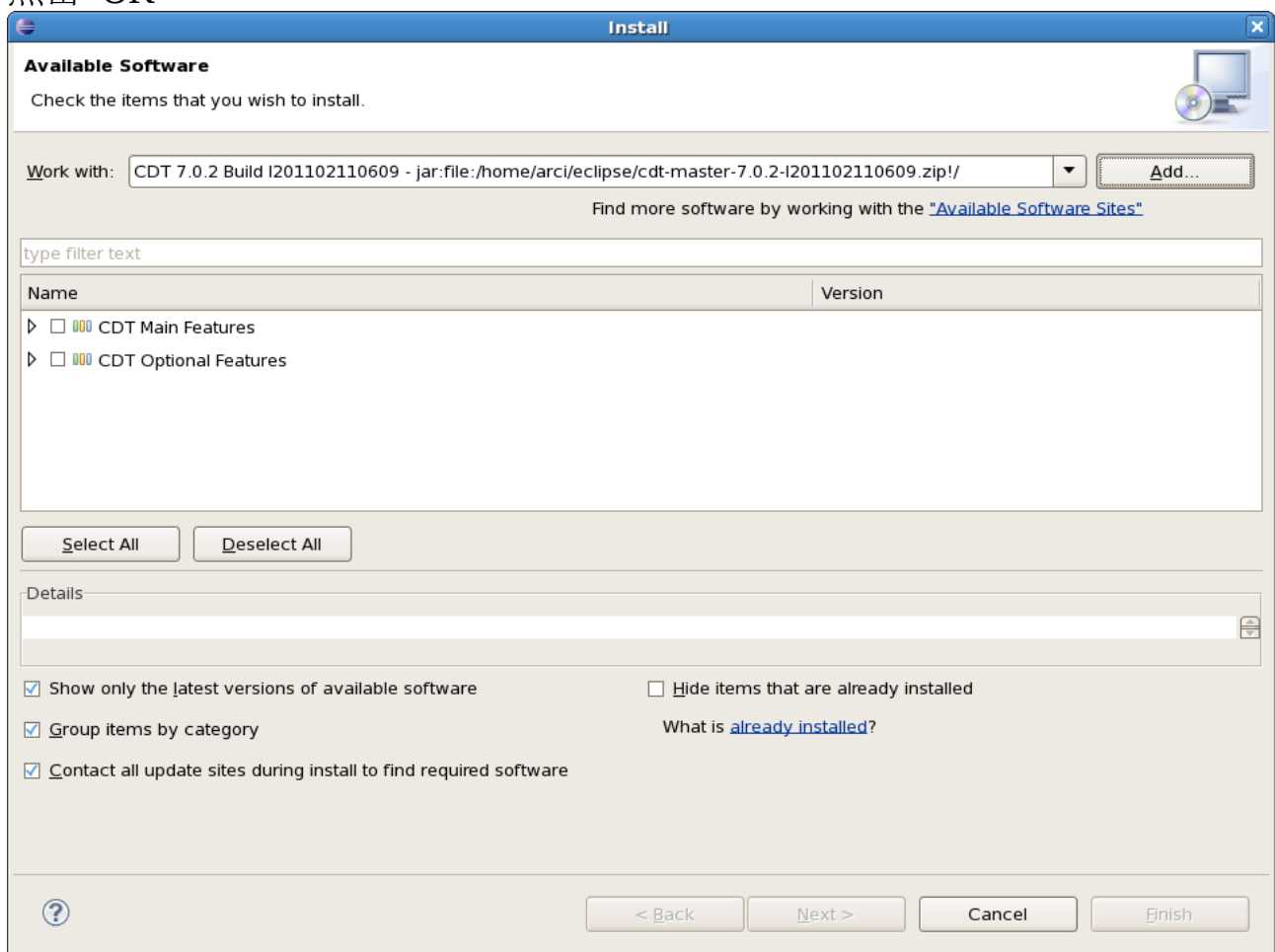


运行 eclipse

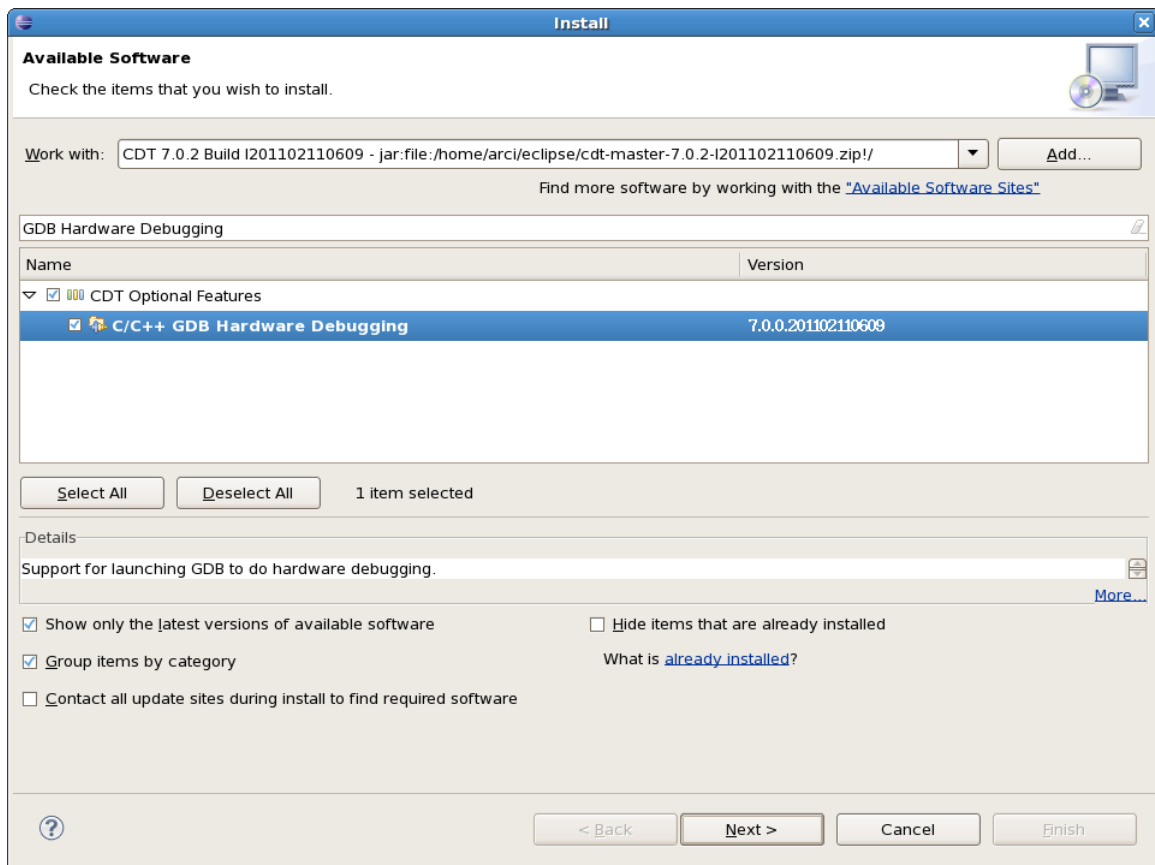
点击“Help”——“Install New Software”，点击“Add”



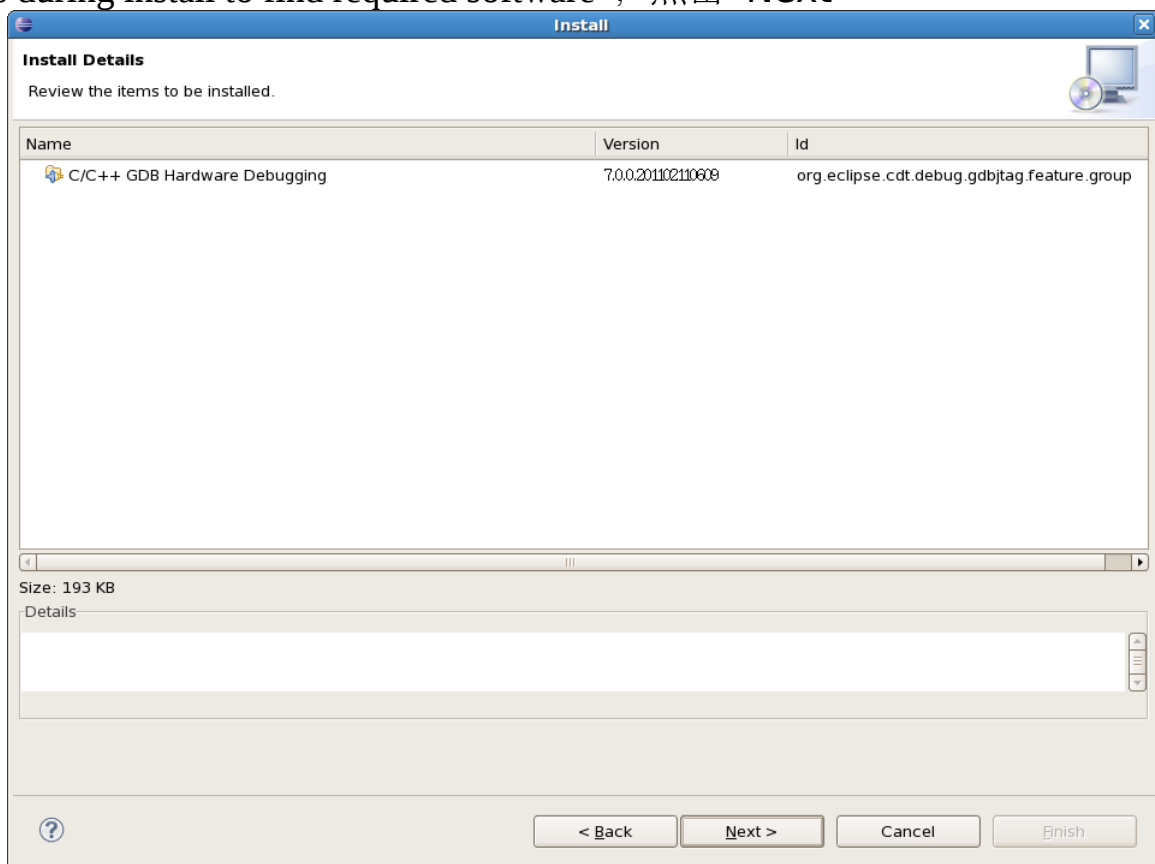
点击“Archive”，选择下载的 GNU ARM Eclipse Plug-in 文件，点击“确定”
点击“OK”



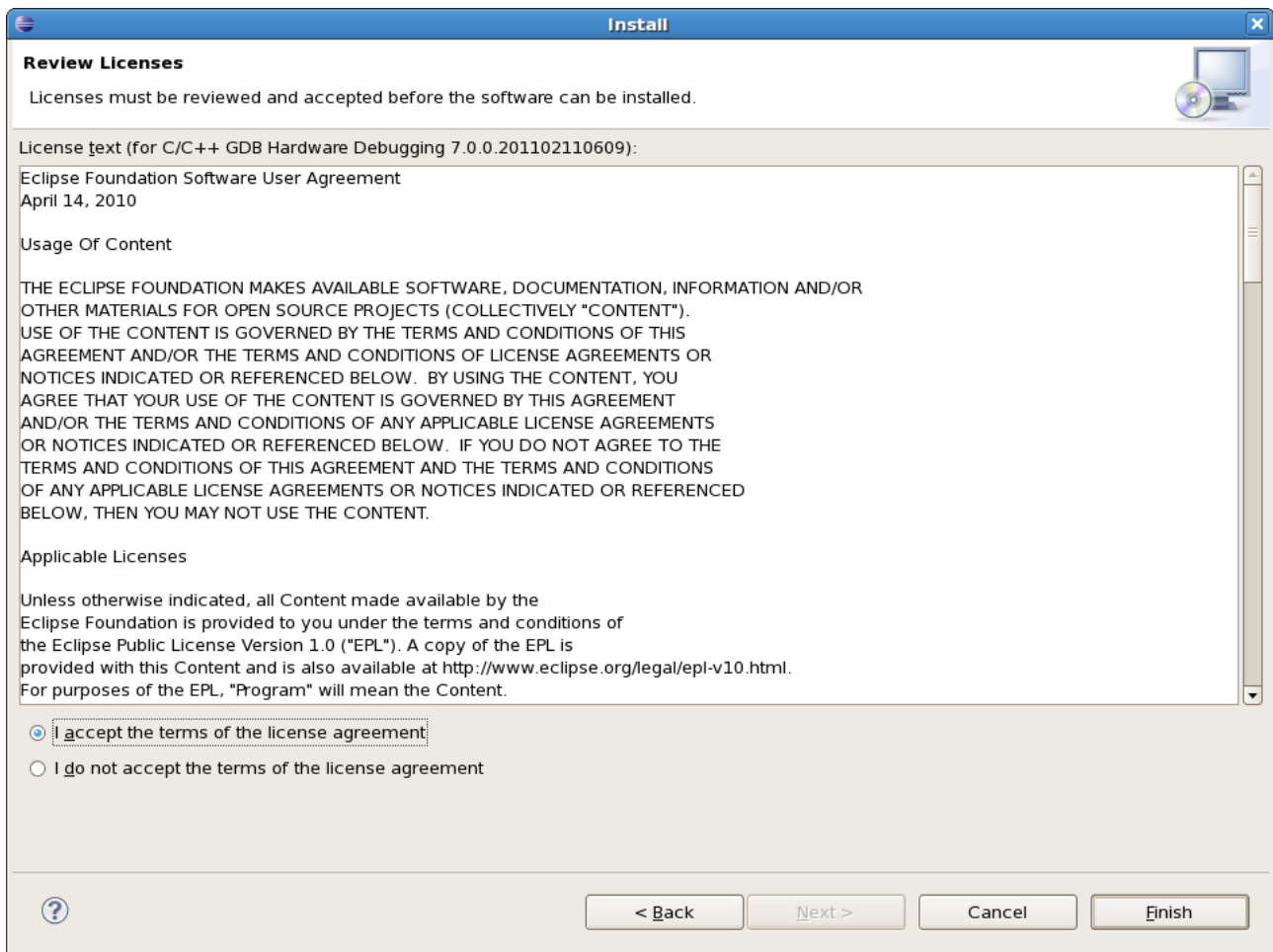
在“type filter text”中输入“GDB Hardware Debugging”



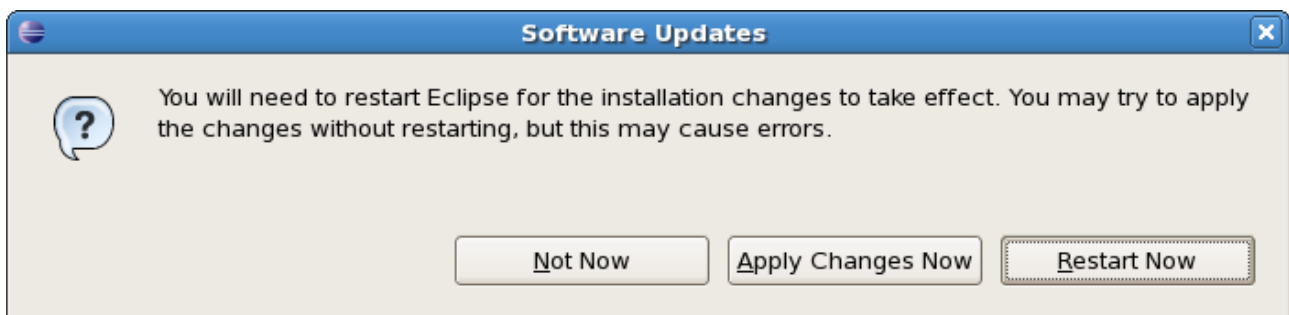
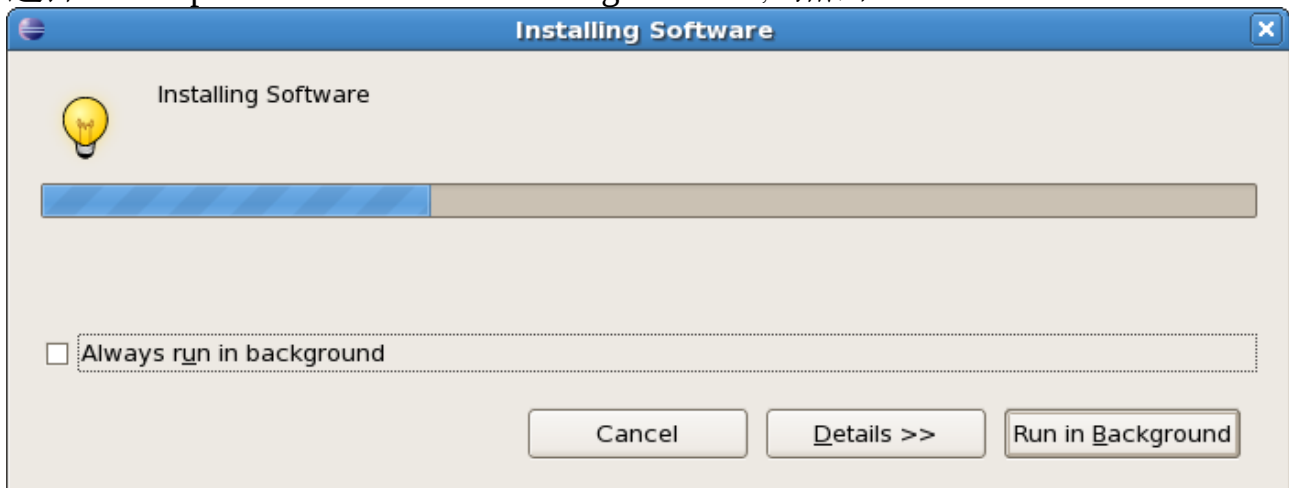
选中“C/C++ GDB Hardware Debugging”，取消选择“Contact all update sites during install to find required software”，点击“Next”



点击“Next”



选择“I accept the terms of the license agreement”，点击“Finish”



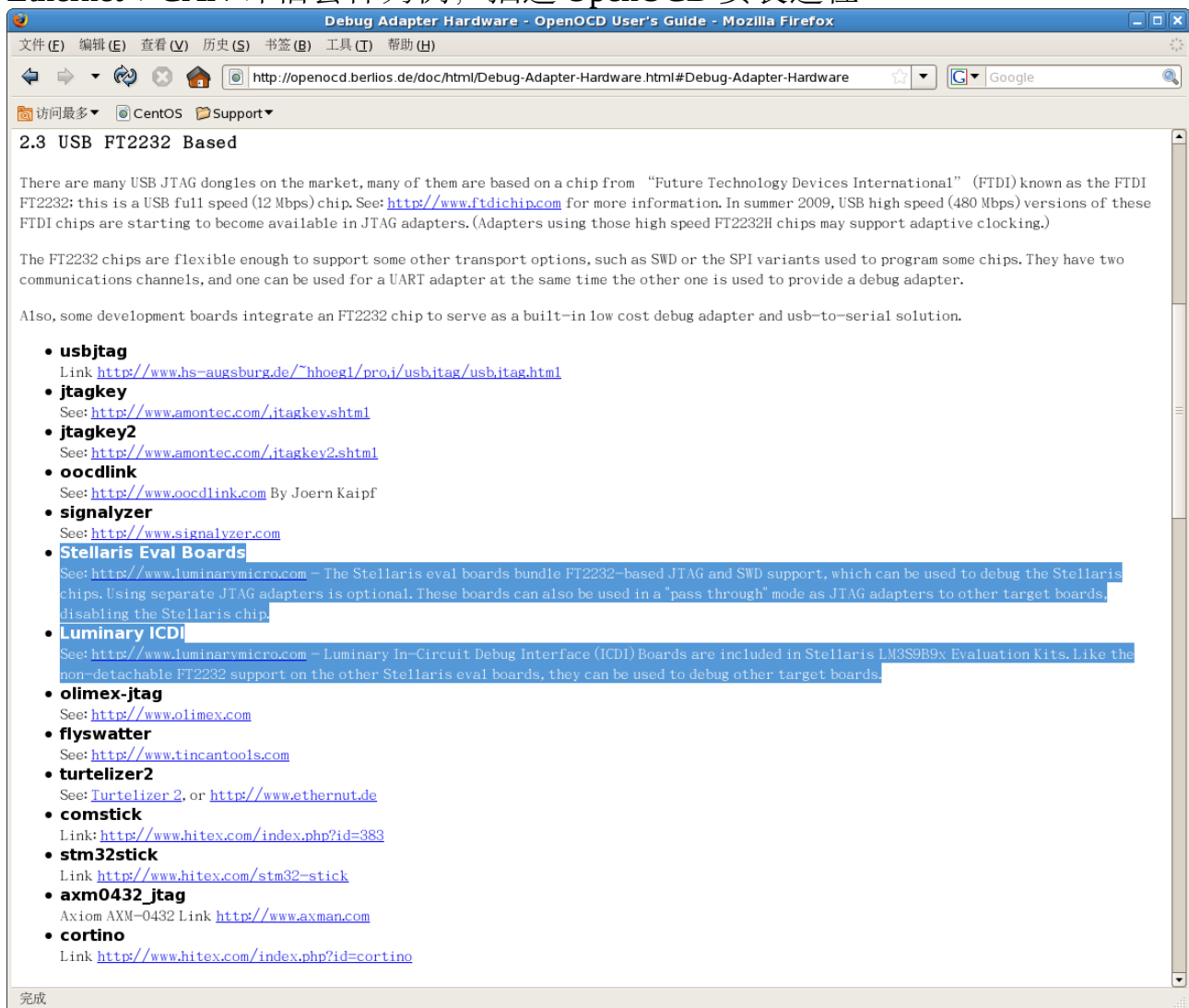
点击“Restart Now”

GDB Hardware Debugging 安装完成

4、OpenOCD - Open On-Chip Debugger 安装

OpenOCD provides on-chip programming and debugging support with a layered architecture of JTAG interface and TAP support, debug target support (e.g. ARM, MIPS), and flash chip drivers (e.g. CFI, NAND, etc.). Several network interfaces are available for interacting with OpenOCD: HTTP, telnet, TCL, and GDB. The GDB server enables OpenOCD to function as a "remote target" for source-level debugging of embedded systems using the GNU GDB program.

由于免费申请了 Stellaris®LM3S8962 Ethernet + CAN 评估套件，板上集成了 ICDI 调试接口，OpenOCD 可以支持此功能，在此以 Stellaris®LM3S8962 Ethernet + CAN 评估套件为例，描述 OpenOCD 安装过程。



Debug Adapter Hardware - OpenOCD User's Guide - Mozilla Firefox

文件(E) 编辑(E) 查看(V) 历史(S) 书签(B) 工具(T) 帮助(H)

http://openocd.berlios.de/doc/html/Debug-Adapter-Hardware.html#Debug-Adapter-Hardware

访问最多 CentOS Support

2.3 USB FT2232 Based

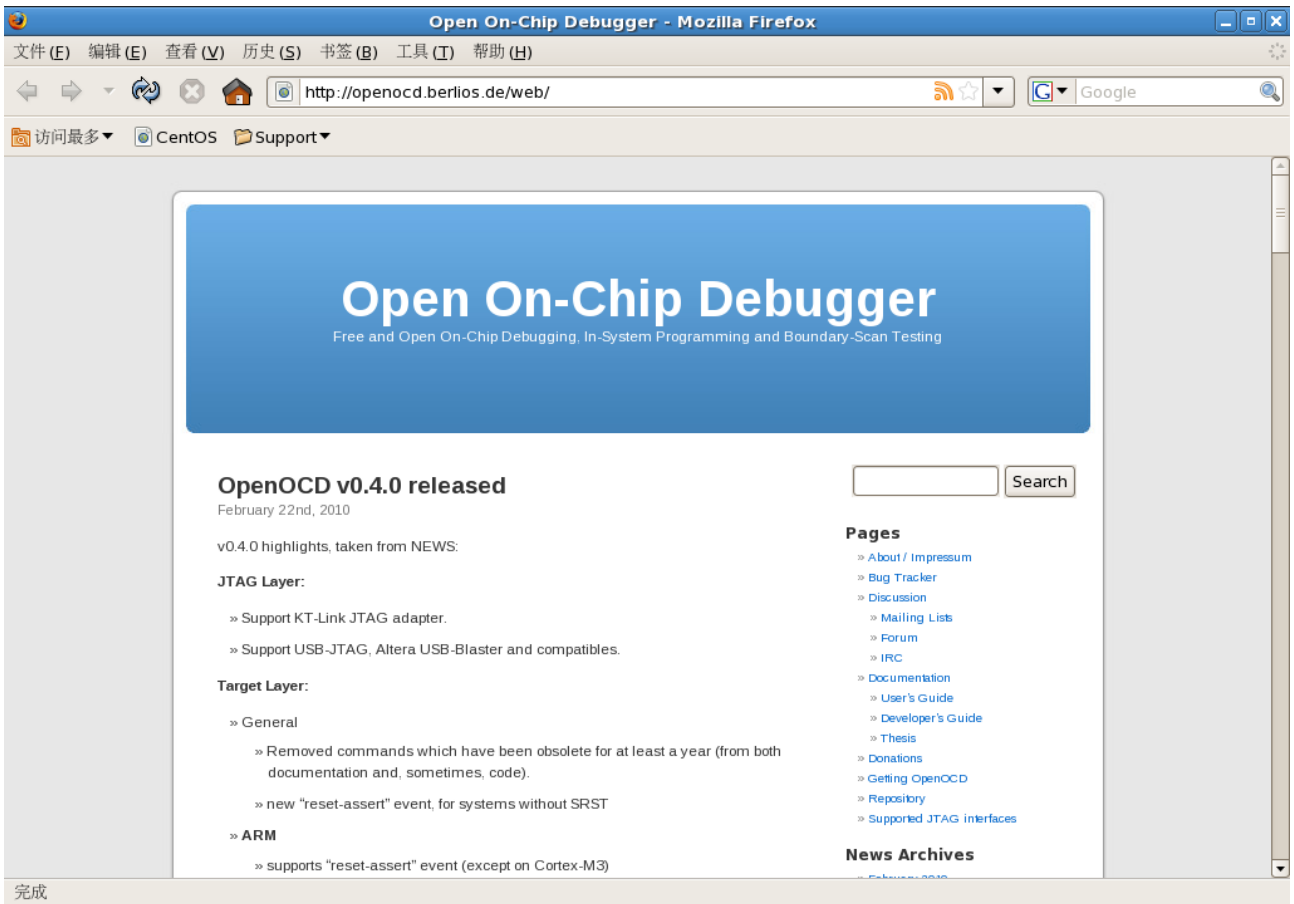
There are many USB JTAG dongles on the market, many of them are based on a chip from "Future Technology Devices International" (FTDI) known as the FTDI FT2232; this is a USB full speed (12 Mbps) chip. See: <http://www.ftdichip.com> for more information. In summer 2009, USB high speed (480 Mbps) versions of these FTDI chips are starting to become available in JTAG adapters. (Adapters using those high speed FT2232H chips may support adaptive clocking.)

The FT2232 chips are flexible enough to support some other transport options, such as SWD or the SPI variants used to program some chips. They have two communications channels, and one can be used for a UART adapter at the same time the other one is used to provide a debug adapter.

Also, some development boards integrate an FT2232 chip to serve as a built-in low cost debug adapter and usb-to-serial solution.

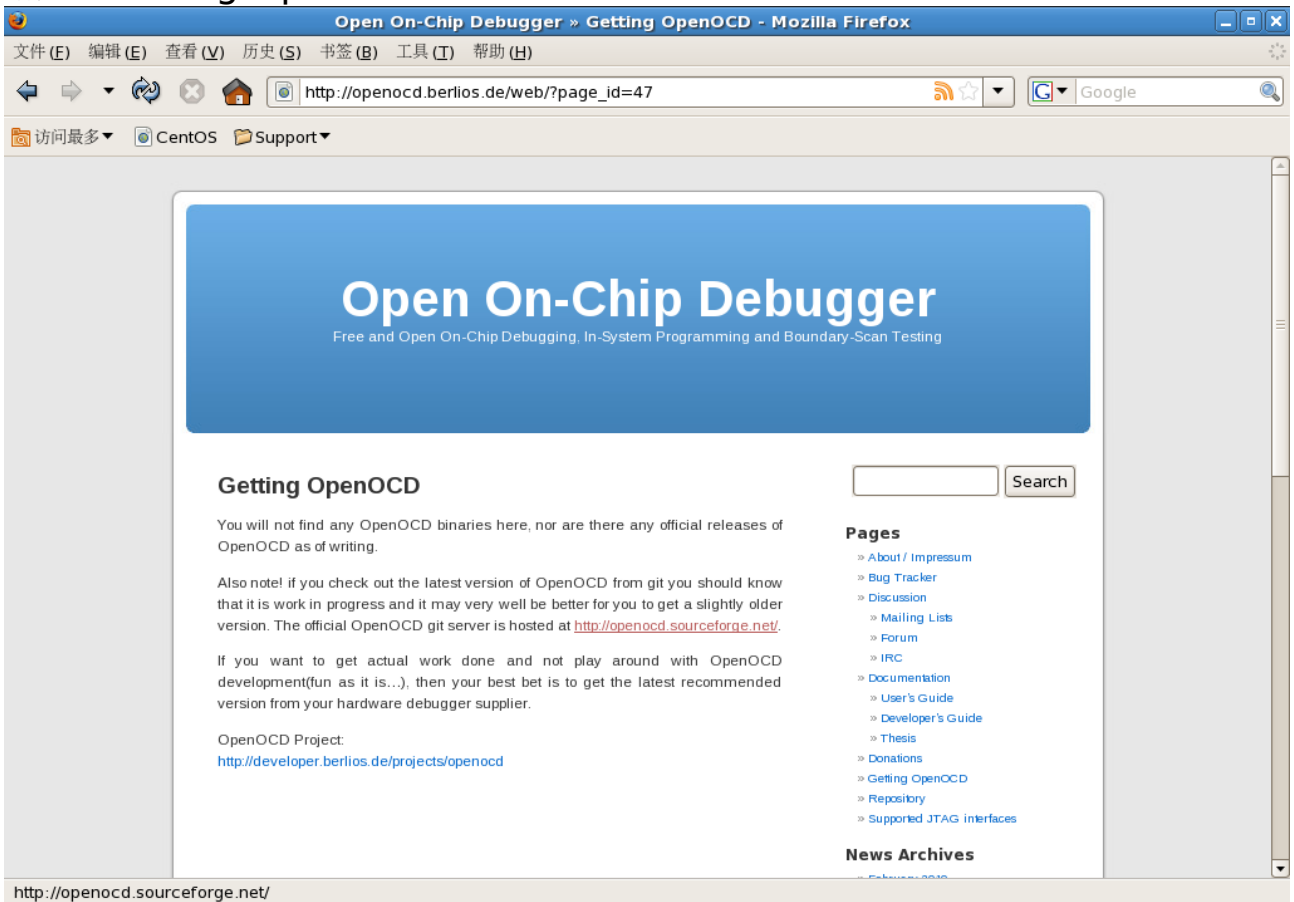
- **usbjtag**
Link <http://www.hs-augsburg.de/~hhoegl/proj/usbjtag/usbjtag.html>
- **jtagkey**
See: <http://www.amontec.com/jtagkey.shtml>
- **jtagkey2**
See: <http://www.amontec.com/jtagkey2.shtml>
- **oocdlink**
See: <http://www.oocdlink.com> By Joern Kaipf
- **signalizer**
See: <http://www.signalizer.com>
- **Stellaris Eval Boards**
See: <http://www.luminarymicro.com> - The Stellaris eval boards bundle FT2232-based JTAG and SWD support, which can be used to debug the Stellaris chips. Using separate JTAG adapters is optional. These boards can also be used in a "pass through" mode as JTAG adapters to other target boards, disabling the Stellaris chip.
- **Luminary ICDI**
See: <http://www.luminarymicro.com> - Luminary In-Circuit Debug Interface (ICDI) Boards are included in Stellaris LM3S9B9x Evaluation Kits. Like the non-detachable FT2232 support on the other Stellaris eval boards, they can be used to debug other target boards.
- **olimex-jtag**
See: <http://www.olimex.com>
- **flyswatter**
See: <http://www.tincantools.com>
- **turtelizer2**
See: [Turtelizer 2](http://www.turtelizer2.com), or <http://www.ethernut.de>
- **comstick**
Link: <http://www.hitex.com/index.php?id=383>
- **stm32stick**
Link <http://www.hitex.com/stm32-stick>
- **axm0432_jtag**
Axiom AXM-0432 Link <http://www.axman.com>
- **cortino**
Link <http://www.hitex.com/index.php?id=cortino>

完成



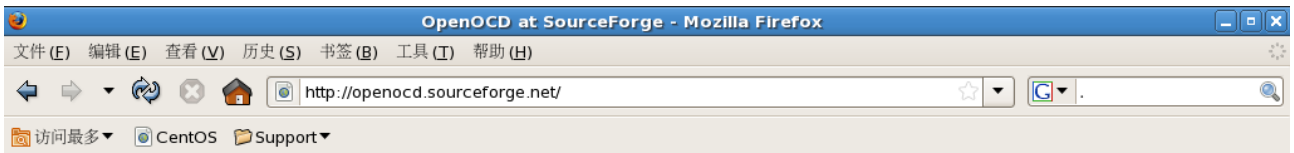
完成

点击“Getting OpenOCD”



<http://openocd.sourceforge.net/>

点击“<http://openocd.sourceforge.net/>”



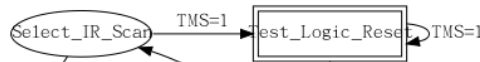
Currently, this SourceForge project hosts the [GIT](#) source repository for the OpenOCD project and copies of the current software release, as well as the Trac Bug Database we started using (at the beginning of February 2010). Mailing lists, and some other stuff, are still at the Berlios.DE website.

Important Web Links

- [SourceForge Project page](#) with
 - [GITweb Summary](#) (including a pointer to an HTTP mirror)
 - [GIT info](#) (are you new to git?)
 - [Bug Database](#)
 - v0.4.0 User's Guide in [HTML](#) or [PDF](#)
 - v0.4.0 Developer's Guide [HTML Doxygen output](#)
- [Berlios Project page](#) with
 - [Mailing list archives](#)
 - Recent User's Guide in [HTML](#) or [PDF](#)
 - Recent Developer's Guide [HTML Doxygen output](#)
 - Old [Web site](#)
- [phpBB forum](#) hosted by SparkFun (not for contacting the developers)

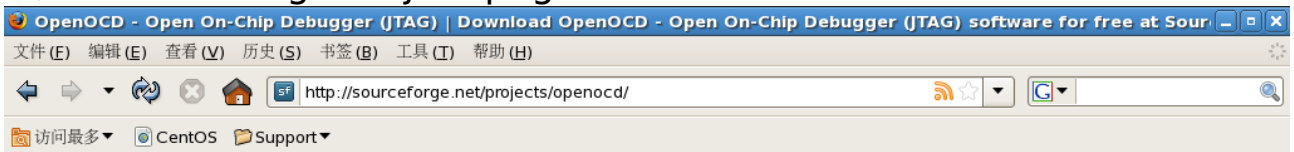
JTAG Info

Wikipedia has a basic [article about JTAG](#). Every TAP implements the same state machine, which you can find in various graphics on the net. If you want to draw your own, this [jtag.dot](#) file can be used with Graphviz to produce this SVG version (or PNG ones, etc). (Hmm, it seems to work better in a standalone viewer ... embedding it in HTML seems to look really nasty, at least in FireFox, because the font sizes are badly goofed ... fixes, anyone?)



完成

点击“SourceForge Project page”



Line Balancing Software
Free download. line balancing, workinstruction & mfg process solutions

Hardware In The Loop
Hardware-in-the-loop Simulation Services and Products
www.opal-rt.com

ARM USB-JTAG Debugger
ULINK is a USB-JTAG hardware debugger for ARM7 devices.
www.keil.com/ulink

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OpenOCD - Open On-Chip Debugger (JTAG) by dbrownell, gowinex, zwelch

Summary Files Reviews Support Develop

The "Open On-Chip Debugger" provides JTAG access from GDB (or directly with TCL scripts) to processors with ARM, MIPS, and other cores. [SF.net](#) hosts the master OpenOCD GIT tree, while openocd.berlios.de hosts the project's web site and mailing lists.

Project Home openocd.sf.net	Recommended By 15 users
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Support sf.net/projects/openocd/support	License GNU General Public License (GPL)

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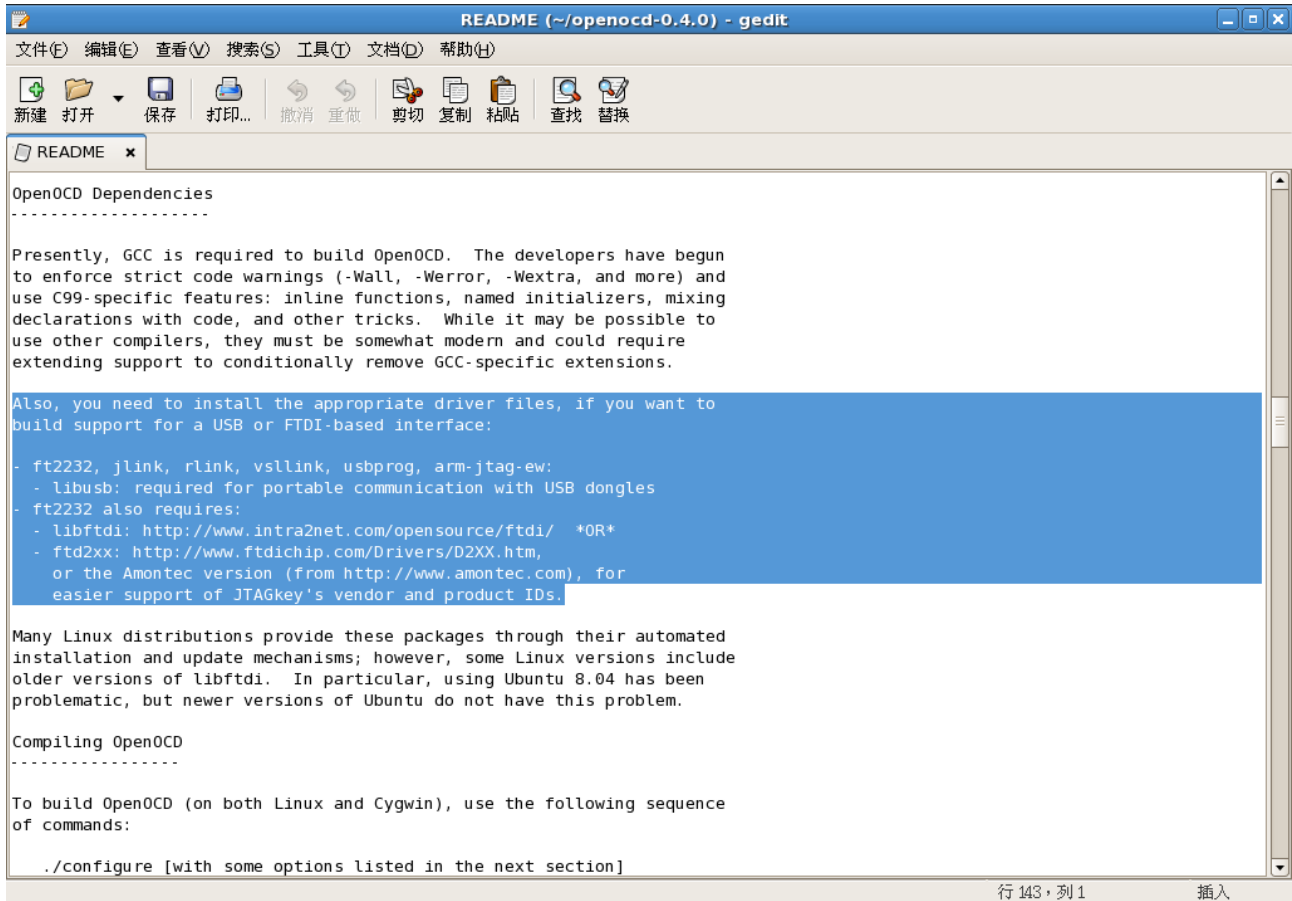
/openocd/0.4.0/openocd-0.4.0.tar.bz2

ware Solutions Architecture
Engineering & Civil
www.aecsystems.co.nz

<http://sourceforge.net/projects/openocd/files/openocd/0.4.0/openocd-0.4.0.tar.bz2/download>

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将下载的压缩文件解压到当前用户主目录，打开目录中的“README”文件



```
OpenOCD Dependencies
-----

Presently, GCC is required to build OpenOCD. The developers have begun
to enforce strict code warnings (-Wall, -Werror, -Wextra, and more) and
use C99-specific features: inline functions, named initializers, mixing
declarations with code, and other tricks. While it may be possible to
use other compilers, they must be somewhat modern and could require
extending support to conditionally remove GCC-specific extensions.

Also, you need to install the appropriate driver files, if you want to
build support for a USB or FTDI-based interface:

- ft2232, jlink, rlink, vsllink, usbprog, arm-jtag-ew:
- libusb: required for portable communication with USB dongles
- ft2232 also requires:
- libftdi: http://www.intra2net.com/opensource/ftdi/ *OR*
- ftd2xx: http://www.ftdichip.com/Drivers/D2XX.htm,
or the Amontec version (from http://www.amontec.com), for
easier support of JTAGkey's vendor and product IDs.

Many Linux distributions provide these packages through their automated
installation and update mechanisms; however, some Linux versions include
older versions of libftdi. In particular, using Ubuntu 8.04 has been
problematic, but newer versions of Ubuntu do not have this problem.

Compiling OpenOCD
-----

To build OpenOCD (on both Linux and Cygwin), use the following sequence
of commands:

./configure [with some options listed in the next section]
```

在文件中可以看到，要提供 FT2232 接口的支持，需要 libusb、libftdi 或 ftd2xx，在此我们选择开源的 libusb 和 libftdi。

参考：

Installing Libftdi on Linux

<http://geckodownloads.googlecode.com/files/linuxinstall.pdf>

4.1、编译安装 libusb

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libusb

About

This is the home of libusb, a library that gives user level applications uniform access to USB devices across many different operating systems. libusb is an open source project licensed under the [GNU Lesser General Public License version 2.1](#).

Many participants in the libusb community have helped and continue to help with ideas, implementation, support and improvements for libusb.

Version overview

There are currently two separate core projects, with non-compatible APIs:

- libusb-1.0
- libusb-0.1

In addition to the core projects there are two sub-projects that provide Windows back-ends:

- libusb-1.0: [windows_backend](#)
- libusb-0.1: [libusb-win32](#)

Stable API: libusb-1.0

Daniel Drake adopted the project in January 2008 and worked on a [libusb-1.0](#) release, which adds several features that were missing from the 0.1 API. As of December 2008, libusb-1.0 is the stable and recommended version to use. Developers are encouraged to port their applications to the new API.

- See the [libusb-1.0](#) page for more information.

<http://www.libusb.org/wiki/libusb-1.0>

点击“libusb-1.0”

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wiki: libusb-1.0

libusb-1.0

libusb-1.0 is an almost-rewrite of the previous stable branch, libusb-0.1. It is a lightweight library that can be efficiently integrated into applications of any kind, with several new features.

libusb-1.0 development is being lead by [Daniel Drake](#) and Peter Stuge. Contributions encouraged!

Down is the new up

Confusingly, another development branch of libusb was created a while ago, also named libusb-1.0. This branch never reached maturity and will not be developed further, although it was forked to form the [OpenUSB project](#). The library you are reading about here can be viewed as a completely different implementation.

Status

The library is complete. New releases will primarily be for bug-fixes. Internal cleanups/improvements and new features (API additions, but not modifications) will be implemented in [libusb-1.1?](#).

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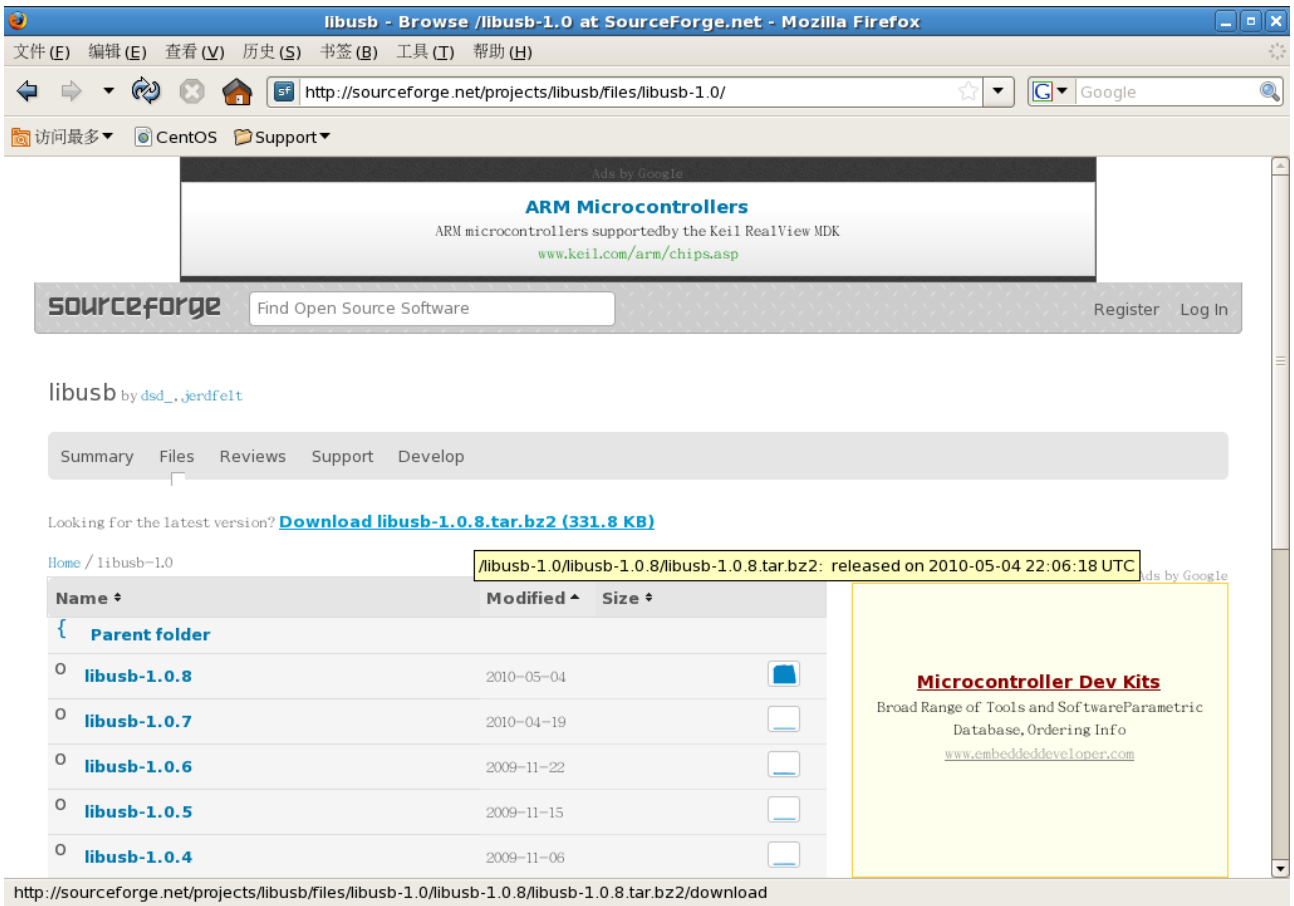
- [Source releases](#)
- Binary packages are (hopefully) provided by your Linux distribution

Documentation

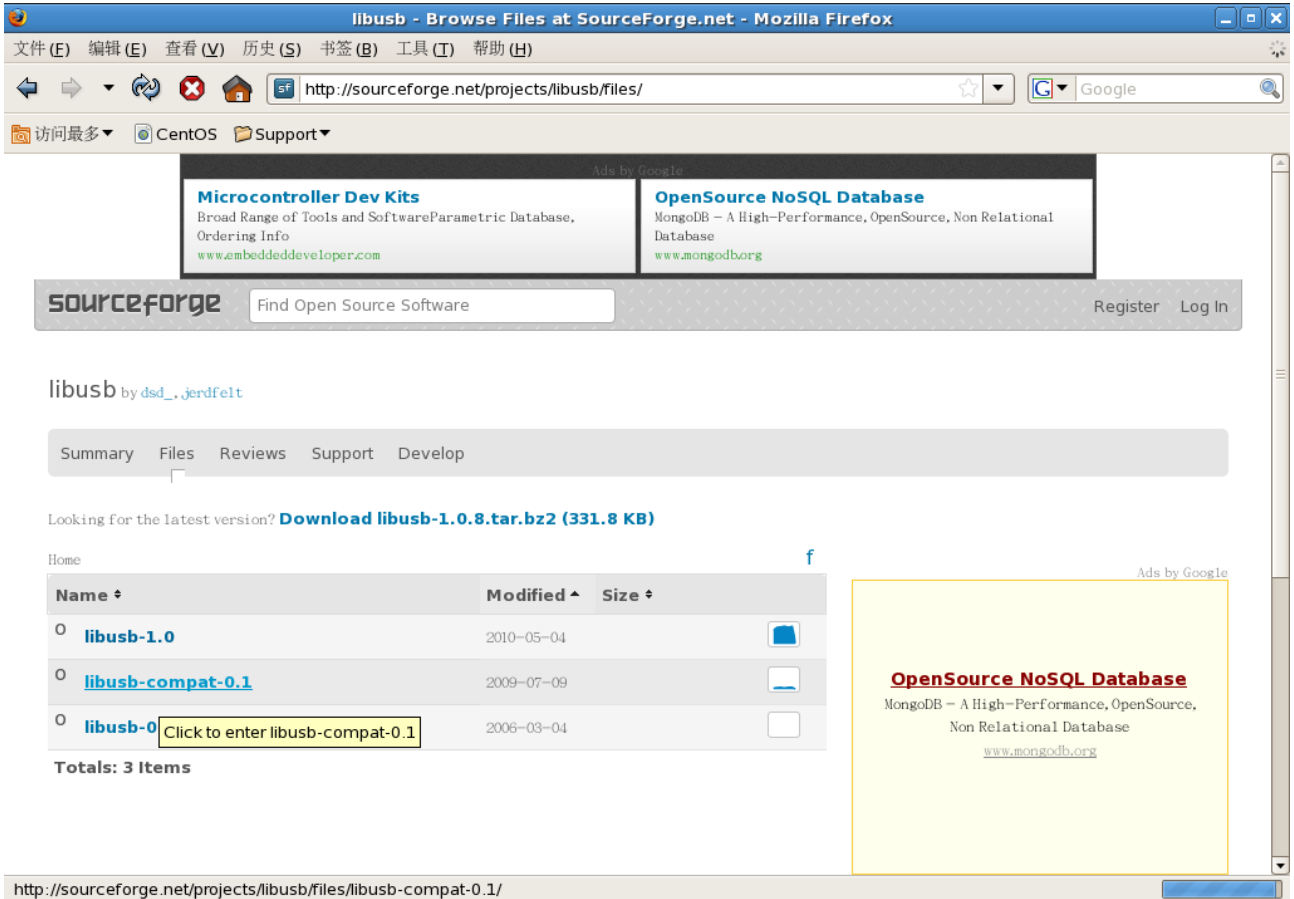
doxygen comments are present in the source and the generated HTML documentation can be found at <http://libusb.sourceforge.net/api-1.0/>

http://sourceforge.net/project/showfiles.php?group_id=1674&package_id=277626

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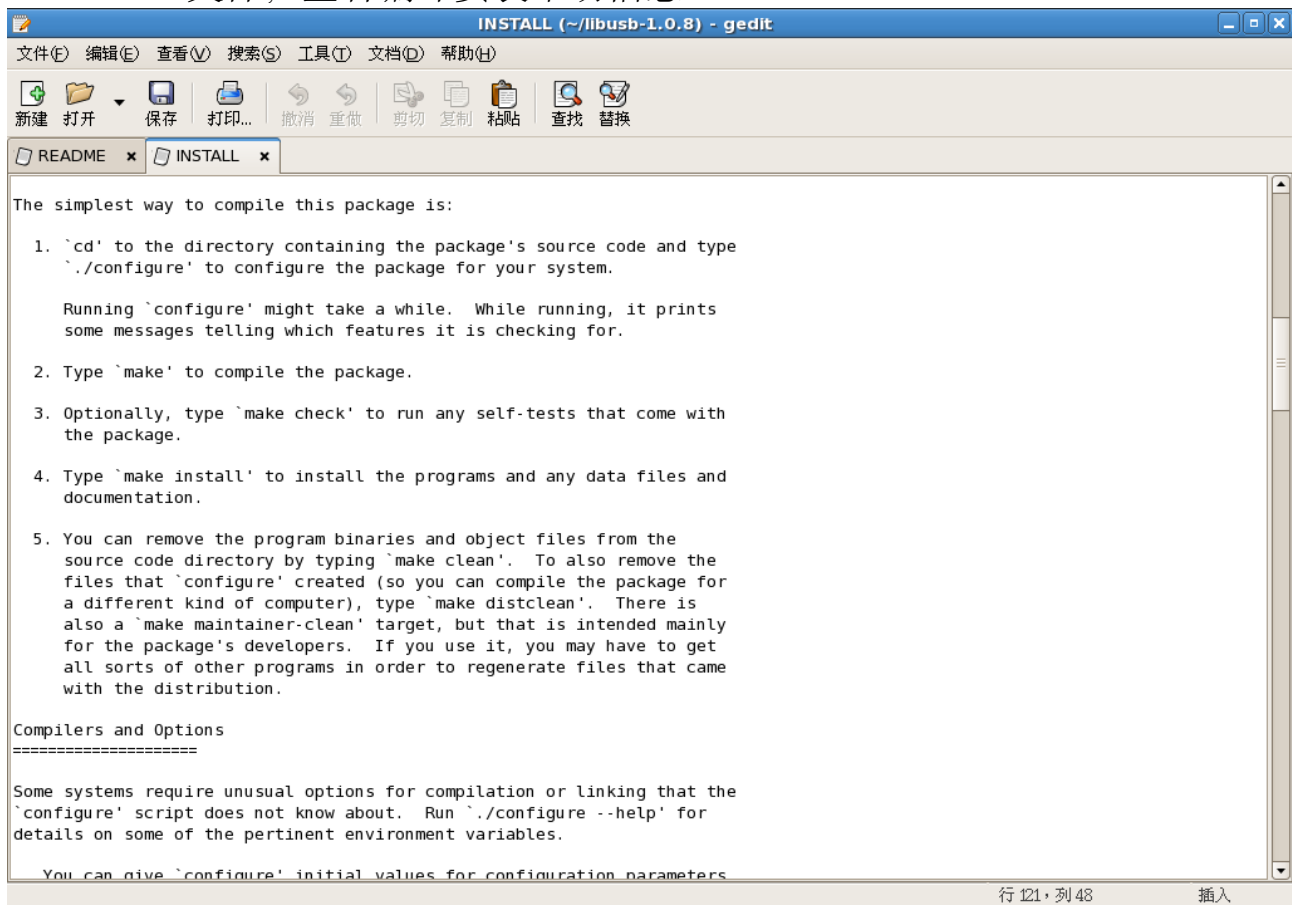
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{ Parent folder		
libusb-compat-0.1.3.tar.bz2	2009-07-09	251.2 KB

Totals: 1 Item 251.2 KB

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点击“libusb-compat-0.1.3.tar.bz2”下载

解压“libusb-1.0.8.tar.bz2”到当前用户主目录，打开目录中的“README”和“INSTALL”文件，查看编译安装帮助信息。



打开终端，运行“./configure”

```
[arci@localhost libusb-1.0.8]$ ./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... /bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
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 for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking build system type... i686-pc-linux-gnu
checking host system type... i686-pc-linux-gnu
checking for a sed that does not truncate output... /bin/sed
checking for grep that handles long lines and -e... /bin/grep
checking for egrep... /bin/grep -E
checking for fgrep... /bin/grep -F
checking for ld used by gcc... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking for BSD- or MS-compatible name lister (nm)... /usr/bin/nm -B
checking the name lister (/usr/bin/nm -B) interface... BSD nm
```

```
checking whether ln -s works... yes
checking the maximum length of command line arguments... 98304
checking whether the shell understands some XSI constructs... yes
checking whether the shell understands "+="... yes
checking for /usr/bin/ld option to reload object files... -r
checking for objdump... objdump
checking how to recognize dependent libraries... pass_all
checking for ar... ar
checking for strip... strip
checking for ranlib... ranlib
checking command to parse /usr/bin/nm -B output from gcc object... ok
checking how to run the C preprocessor... gcc -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for unistd.h... yes
checking for dlfcn.h... yes
checking for objdir... .libs
checking if gcc supports -fno-rtti -fno-exceptions... no
checking for gcc option to produce PIC... -fPIC -DPIC
checking if gcc PIC flag -fPIC -DPIC works... yes
checking if gcc static flag -static works... yes
checking if gcc supports -c -o file.o... yes
checking if gcc supports -c -o file.o... (cached) yes
checking whether the gcc linker (/usr/bin/ld) supports shared libraries... yes
checking whether -lc should be explicitly linked in... no
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... yes
checking whether to build static libraries... yes
checking for inline... inline
checking whether gcc and cc understand -c and -o together... yes
checking operating system... Linux
checking for clock_gettime in -lrt... yes
checking sys/timerfd.h usability... no
checking sys/timerfd.h presence... no
checking for sys/timerfd.h... no
checking whether TFD_NONBLOCK is declared... no
checking whether to use timerfd for timing... no (header not available)
configure: creating ./config.status
config.status: creating libusb-1.0.pc
config.status: creating Makefile
config.status: creating libusb/Makefile
config.status: creating examples/Makefile
config.status: creating doc/Makefile
config.status: creating doc/doxygen.cfg
config.status: creating config.h
config.status: executing depfiles commands
config.status: executing libtool commands
[arci@localhost libusb-1.0.8]$
```

运行“make”

```
[arci@localhost libusb-1.0.8]$ make
make all-recursive
make[1]: Entering directory `/home/arci/libusb-1.0.8'
Making all in libusb
make[2]: Entering directory `/home/arci/libusb-1.0.8/libusb'
  CC    libusb_1_0_la-core.lo
  CC    libusb_1_0_la-descriptor.lo
  CC    libusb_1_0_la-io.lo
  CC    libusb_1_0_la-sync.lo
  CC    libusb_1_0_la-linux_usbfs.lo
  CCLD  libusb-1.0.la
make[2]: Leaving directory `/home/arci/libusb-1.0.8/libusb'
Making all in doc
make[2]: Entering directory `/home/arci/libusb-1.0.8/doc'
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/home/arci/libusb-1.0.8/doc'
make[2]: Entering directory `/home/arci/libusb-1.0.8'
make[2]: Nothing to be done for `all-am'.
make[2]: Leaving directory `/home/arci/libusb-1.0.8'
make[1]: Leaving directory `/home/arci/libusb-1.0.8'
[arci@localhost libusb-1.0.8]$
```

运行“make install”

```
[arci@localhost libusb-1.0.8]$ make install
Making install in libusb
make[1]: Entering directory `/home/arci/libusb-1.0.8/libusb'
make[2]: Entering directory `/home/arci/libusb-1.0.8/libusb'
test -z "/usr/local/lib" || /bin/mkdir -p "/usr/local/lib"
/bin/sh ../libtool --mode=install /usr/bin/install -c libusb-1.0.la '/usr/local/lib'
libtool: install: /usr/bin/install -c .libs/libusb-1.0.so.0.0.0 /usr/local/lib/libusb-1.0.so.0.0.0
/usr/bin/install: cannot create regular file `/usr/local/lib/libusb-1.0.so.0.0.0': Permission
denied
make[2]: *** [install-libLTLIBRARIES] 错误 1
make[2]: Leaving directory `/home/arci/libusb-1.0.8/libusb'
make[1]: *** [install-am] 错误 2
make[1]: Leaving directory `/home/arci/libusb-1.0.8/libusb'
make: *** [install-recursive] 错误 1
[arci@localhost libusb-1.0.8]$
```

此错误是由于当前用户权限不够引起的

运行“su”，并输入 root 帐户密码

```
[arci@localhost libusb-1.0.8]$ su
```

口令:

```
[root@localhost libusb-1.0.8]#
```

重新运行“make install”

```
[root@localhost libusb-1.0.8]# make install
Making install in libusb
make[1]: Entering directory `/home/arci/libusb-1.0.8/libusb'
make[2]: Entering directory `/home/arci/libusb-1.0.8/libusb'
test -z "/usr/local/lib" || /bin/mkdir -p "/usr/local/lib"
/bin/sh ../libtool --mode=install /usr/bin/install -c libusb-1.0.la '/usr/local/lib'
libtool: install: /usr/bin/install -c .libs/libusb-1.0.so.0.0.0 /usr/local/lib/libusb-1.0.so.0.0.0
libtool: install: (cd /usr/local/lib && { ln -s -f libusb-1.0.so.0.0.0 libusb-1.0.so.0 || { rm -f
libusb-1.0.so.0 && ln -s libusb-1.0.so.0.0.0 libusb-1.0.so.0; }; })
libtool: install: (cd /usr/local/lib && { ln -s -f libusb-1.0.so.0.0.0 libusb-1.0.so || { rm -f
libusb-1.0.so && ln -s libusb-1.0.so.0.0.0 libusb-1.0.so; }; })
libtool: install: /usr/bin/install -c .libs/libusb-1.0.lai /usr/local/lib/libusb-1.0.la
libtool: install: /usr/bin/install -c .libs/libusb-1.0.a /usr/local/lib/libusb-1.0.a
```

```
libtool: install: chmod 644 /usr/local/lib/libusb-1.0.a
libtool: install: ranlib /usr/local/lib/libusb-1.0.a
libtool: finish:
PATH="/usr/kerberos/sbin:/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/arci/bin:/sbin" ldconfig -n /usr/local/lib
```

Libraries have been installed in:
 /usr/local/lib

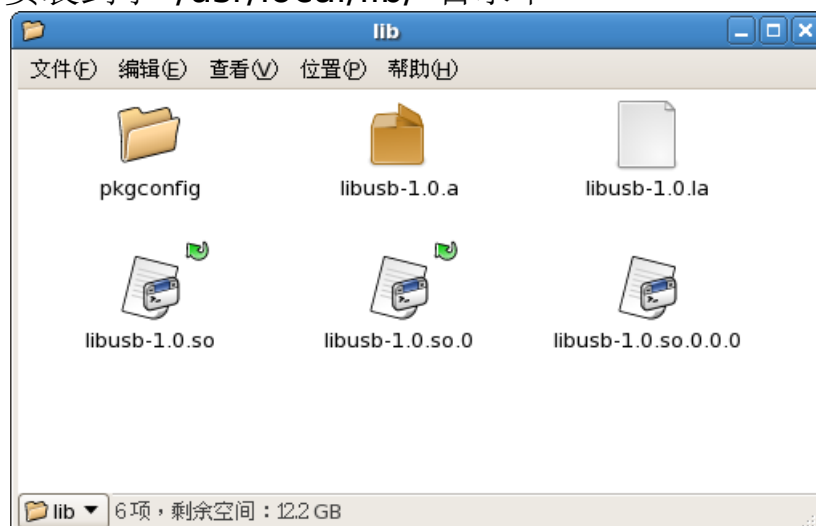
If you ever happen to want to link against installed libraries in a given directory, LIBDIR, you must either use libtool, and specify the full pathname of the library, or use the `-LLIBDIR` flag during linking and do at least one of the following:

- add LIBDIR to the `LD_LIBRARY_PATH` environment variable during execution
- add LIBDIR to the `LD_RUN_PATH` environment variable during linking
- use the `-Wl,-rpath -Wl,LIBDIR` linker flag
- have your system administrator add LIBDIR to `/etc/ld.so.conf`

See any operating system documentation about shared libraries for more information, such as the `ld(1)` and `ld.so(8)` manual pages.

```
-----
test -z "/usr/local/include/libusb-1.0" || /bin/mkdir -p "/usr/local/include/libusb-1.0"
/usr/bin/install -c -m 644 libusb.h /usr/local/include/libusb-1.0
make[2]: Leaving directory `/home/arci/libusb-1.0.8/libusb'
make[1]: Leaving directory `/home/arci/libusb-1.0.8/libusb'
Making install in doc
make[1]: Entering directory `/home/arci/libusb-1.0.8/doc'
make[2]: Entering directory `/home/arci/libusb-1.0.8/doc'
make[2]: Nothing to be done for `install-exec-am'.
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/home/arci/libusb-1.0.8/doc'
make[1]: Leaving directory `/home/arci/libusb-1.0.8/doc'
make[1]: Entering directory `/home/arci/libusb-1.0.8'
make[2]: Entering directory `/home/arci/libusb-1.0.8'
make[2]: Nothing to be done for `install-exec-am'.
test -z "/usr/local/lib/pkgconfig" || /bin/mkdir -p "/usr/local/lib/pkgconfig"
/usr/bin/install -c -m 644 libusb-1.0.pc /usr/local/lib/pkgconfig'
make[2]: Leaving directory `/home/arci/libusb-1.0.8'
make[1]: Leaving directory `/home/arci/libusb-1.0.8'
[root@localhost libusb-1.0.8]#
```

libusb-1.0.8 安装到了“/usr/local/lib/”目录中。



解压“libusb-compat-0.1.3.tar.bz2”到当前用户主目录，打开目录中的“README”和“INSTALL”文件，查看编译安装帮助信息。

打开终端，运行“./configure”

```
[root@localhost libusb-compat-0.1.3]# ./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... /bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
checking for gcc... gcc
checking for C compiler default output file name... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
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 for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking build system type... i686-pc-linux-gnu
checking host system type... i686-pc-linux-gnu
checking for a sed that does not truncate output... /bin/sed
checking for grep that handles long lines and -e... /bin/grep
checking for egrep... /bin/grep -E
checking for fgrep... /bin/grep -F
checking for ld used by gcc... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking for BSD- or MS-compatible name lister (nm)... /usr/bin/nm -B
checking the name lister (/usr/bin/nm -B) interface... BSD nm
checking whether ln -s works... yes
checking the maximum length of command line arguments... 98304
checking whether the shell understands some XSI constructs... yes
checking whether the shell understands "+="... yes
checking for /usr/bin/ld option to reload object files... -r
checking for objdump... objdump
checking how to recognize dependent libraries... pass_all
checking for ar... ar
checking for strip... strip
checking for ranlib... ranlib
checking command to parse /usr/bin/nm -B output from gcc object... ok
checking how to run the C preprocessor... gcc -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for unistd.h... yes
checking for dlfcn.h... yes
checking for objdir... .libs
checking if gcc supports -fno-rtti -fno-exceptions... no
checking for gcc option to produce PIC... -fPIC -DPIC
checking if gcc PIC flag -fPIC -DPIC works... yes
checking if gcc static flag -static works... yes
```

checking if gcc supports -c -o file.o... yes
checking if gcc supports -c -o file.o... (cached) yes
checking whether the gcc linker (/usr/bin/ld) supports shared libraries... yes
checking whether -lc should be explicitly linked in... no
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... yes
checking whether to build static libraries... yes
checking for inline... inline
checking whether gcc and cc understand -c and -o together... yes
checking for pkg-config... /usr/bin/pkg-config
checking pkg-config is at least version 0.9.0... yes
checking for LIBUSB_1_0... configure: error: Package requirements (libusb-1.0 >= 0.9.1)
were not met:

No package 'libusb-1.0' found

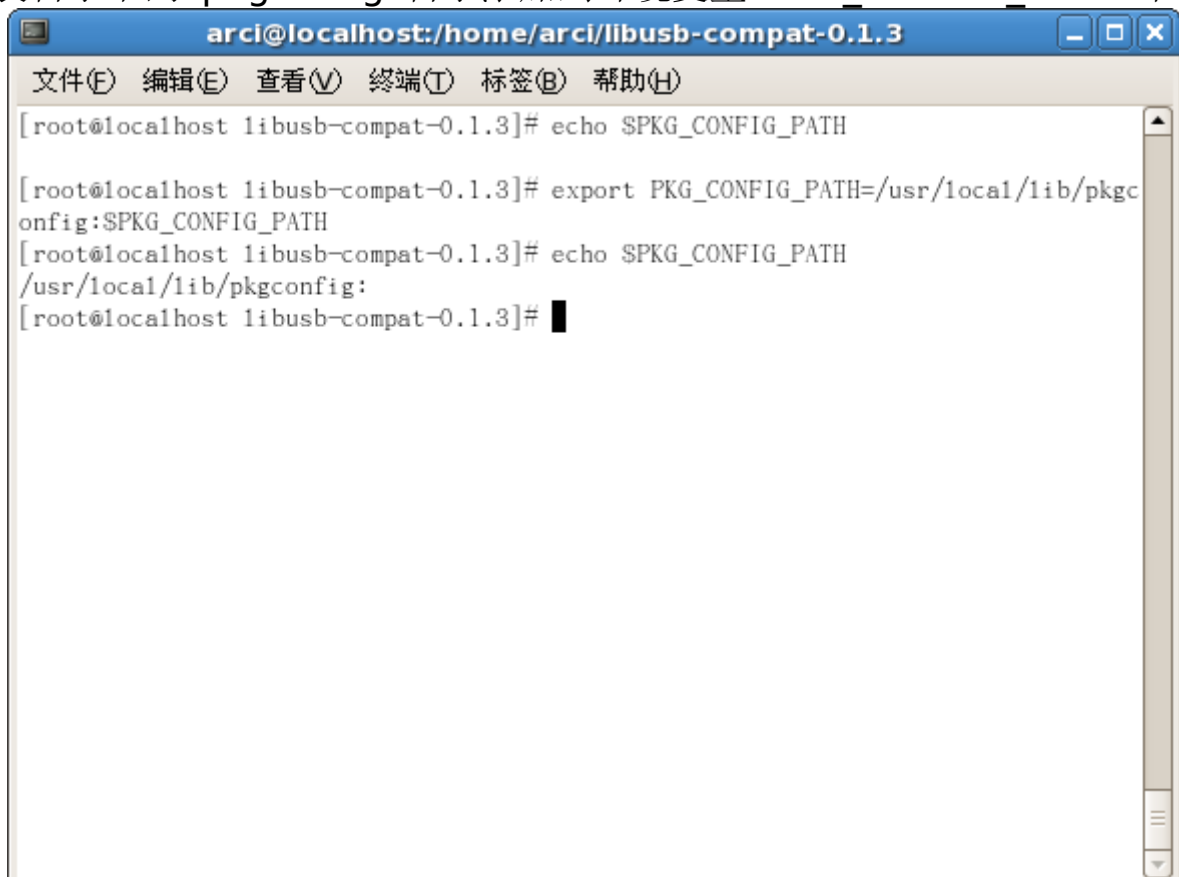
Consider adjusting the PKG_CONFIG_PATH environment variable if you
installed software in a non-standard prefix.

Alternatively, you may set the environment variables LIBUSB_1_0_CFLAGS
and LIBUSB_1_0_LIBS to avoid the need to call pkg-config.
See the pkg-config man page for more details.

[root@localhost libusb-compat-0.1.3]#

此错误是由于未能找到“libusb-1.0”库引起的。

根据提示使用“export”命令修改环境变量“PKG_CONFIG_PATH”，将 libusb
安装目录下的“pkgconfig”目录添加到环境变量“PKG_CONFIG_PATH”中



```
arci@localhost:/home/arci/libusb-compat-0.1.3
文件(F) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)
[root@localhost libusb-compat-0.1.3]# echo $PKG_CONFIG_PATH
[root@localhost libusb-compat-0.1.3]# export PKG_CONFIG_PATH=/usr/local/lib/pkgconfig:$PKG_CONFIG_PATH
[root@localhost libusb-compat-0.1.3]# echo $PKG_CONFIG_PATH
/usr/local/lib/pkgconfig:
[root@localhost libusb-compat-0.1.3]#
```


重新运行“./configure”

```
[root@localhost libusb-compat-0.1.3]# ./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... /bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
checking for gcc... gcc
checking for C compiler default output file name... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
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 for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking build system type... i686-pc-linux-gnu
checking host system type... i686-pc-linux-gnu
checking for a sed that does not truncate output... /bin/sed
checking for grep that handles long lines and -e... /bin/grep
checking for egrep... /bin/grep -E
checking for fgrep... /bin/grep -F
checking for ld used by gcc... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking for BSD- or MS-compatible name lister (nm)... /usr/bin/nm -B
checking the name lister (/usr/bin/nm -B) interface... BSD nm
checking whether ln -s works... yes
checking the maximum length of command line arguments... 98304
checking whether the shell understands some XSI constructs... yes
checking whether the shell understands "+="... yes
checking for /usr/bin/ld option to reload object files... -r
checking for objdump... objdump
checking how to recognize dependent libraries... pass_all
checking for ar... ar
checking for strip... strip
checking for ranlib... ranlib
checking command to parse /usr/bin/nm -B output from gcc object... ok
checking how to run the C preprocessor... gcc -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for unistd.h... yes
checking for dlfcn.h... yes
checking for objdir... .libs
checking if gcc supports -fno-rtti -fno-exceptions... no
checking for gcc option to produce PIC... -fPIC -DPIC
checking if gcc PIC flag -fPIC -DPIC works... yes
checking if gcc static flag -static works... yes
checking if gcc supports -c -o file.o... yes
checking if gcc supports -c -o file.o... (cached) yes
checking whether the gcc linker (/usr/bin/ld) supports shared libraries... yes
```

```
checking whether -lc should be explicitly linked in... no
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... yes
checking whether to build static libraries... yes
checking for inline... inline
checking whether gcc and cc understand -c and -o together... yes
checking for pkg-config... /usr/bin/pkg-config
checking pkg-config is at least version 0.9.0... yes
checking for LIBUSB_1_0... yes
configure: creating ./config.status
config.status: creating libusb.pc
config.status: creating libusb-config
config.status: creating Makefile
config.status: creating libusb/Makefile
config.status: creating examples/Makefile
config.status: creating config.h
config.status: executing depfiles commands
config.status: executing libtool commands
config.status: executing default commands
[root@localhost libusb-compat-0.1.3]#
```

运行“make”

```
[root@localhost libusb-compat-0.1.3]# make
make all-recursive
make[1]: Entering directory `/home/arci/libusb-compat-0.1.3'
Making all in libusb
make[2]: Entering directory `/home/arci/libusb-compat-0.1.3/libusb'
/bin/sh ../libtool --tag=CC --mode=compile gcc -DHAVE_CONFIG_H -I. -I.
-fvisibility=hidden -std=gnu99 -fgnu89-inline -Wall -Wundef -Wunused -Wstrict-prototypes
-Werror-implicit-function-declaration -Wno-pointer-sign -Wshadow
-I/usr/local/include/libusb-1.0 -g -O2 -MT libusb_la-core.lo -MD -MP -MF .deps/libusb_la-
core.Tpo -c -o libusb_la-core.lo `test -f 'core.c' || echo './'` core.c
libtool: compile: gcc -DHAVE_CONFIG_H -I. -I. -fvisibility=hidden -std=gnu99 -fgnu89-
inline -Wall -Wundef -Wunused -Wstrict-prototypes -Werror-implicit-function-declaration
-Wno-pointer-sign -Wshadow -I/usr/local/include/libusb-1.0 -g -O2 -MT libusb_la-core.lo -MD
-MP -MF .deps/libusb_la-core.Tpo -c core.c -fPIC -DPIC -o .libs/libusb_la-core.o
libtool: compile: gcc -DHAVE_CONFIG_H -I. -I. -fvisibility=hidden -std=gnu99 -fgnu89-
inline -Wall -Wundef -Wunused -Wstrict-prototypes -Werror-implicit-function-declaration
-Wno-pointer-sign -Wshadow -I/usr/local/include/libusb-1.0 -g -O2 -MT libusb_la-core.lo -MD
-MP -MF .deps/libusb_la-core.Tpo -c core.c -o libusb_la-core.o >/dev/null 2>&1
mv -f .deps/libusb_la-core.Tpo .deps/libusb_la-core.Plo
/bin/sh ../libtool --tag=CC --mode=link gcc -fvisibility=hidden -std=gnu99 -fgnu89-inline
-Wall -Wundef -Wunused -Wstrict-prototypes -Werror-implicit-function-declaration -Wno-
pointer-sign -Wshadow -I/usr/local/include/libusb-1.0 -g -O2 -version-info 8:4:4 -release
0.1 -o libusb.la -rpath /usr/local/lib libusb_la-core.lo -L/usr/local/lib -lusb-1.0
libtool: link: gcc -shared .libs/libusb_la-core.o -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath
-Wl,/usr/local/lib -L/usr/local/lib /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-soname
-Wl,libusb-0.1.so.4 -o .libs/libusb-0.1.so.4.4.4
libtool: link: (cd ".libs" && rm -f "libusb-0.1.so.4" && ln -s "libusb-0.1.so.4.4.4" "libusb-
0.1.so.4")
libtool: link: (cd ".libs" && rm -f "libusb.so" && ln -s "libusb-0.1.so.4.4.4" "libusb.so")
libtool: link: ar cru .libs/libusb.a libusb_la-core.o
libtool: link: ranlib .libs/libusb.a
libtool: link: ( cd ".libs" && rm -f "libusb.la" && ln -s "../libusb.la" "libusb.la" )
make[2]: Leaving directory `/home/arci/libusb-compat-0.1.3/libusb'
make[2]: Entering directory `/home/arci/libusb-compat-0.1.3'
make[2]: Nothing to be done for `all-am'.
```

```
make[2]: Leaving directory `/home/arci/libusb-compat-0.1.3'
```

```
make[1]: Leaving directory `/home/arci/libusb-compat-0.1.3'
```

```
[root@localhost libusb-compat-0.1.3]#
```

运行“make install”

```
[root@localhost libusb-compat-0.1.3]# make install
```

```
Making install in libusb
```

```
make[1]: Entering directory `/home/arci/libusb-compat-0.1.3/libusb'
```

```
make[2]: Entering directory `/home/arci/libusb-compat-0.1.3/libusb'
```

```
test -z "/usr/local/lib" || /bin/mkdir -p "/usr/local/lib"
```

```
/bin/sh ../libtool --mode=install /usr/bin/install -c 'libusb.la' '/usr/local/lib/libusb.la'
```

```
libtool: install: /usr/bin/install -c .libs/libusb-0.1.so.4.4.4 /usr/local/lib/libusb-0.1.so.4.4.4
```

```
libtool: install: (cd /usr/local/lib && { ln -s -f libusb-0.1.so.4.4.4 libusb-0.1.so.4 || { rm -f libusb-0.1.so.4 && ln -s libusb-0.1.so.4.4.4 libusb-0.1.so.4; }; })
```

```
libtool: install: (cd /usr/local/lib && { ln -s -f libusb-0.1.so.4.4.4 libusb.so || { rm -f libusb.so && ln -s libusb-0.1.so.4.4.4 libusb.so; }; })
```

```
libtool: install: /usr/bin/install -c .libs/libusb.lai /usr/local/lib/libusb.la
```

```
libtool: install: /usr/bin/install -c .libs/libusb.a /usr/local/lib/libusb.a
```

```
libtool: install: chmod 644 /usr/local/lib/libusb.a
```

```
libtool: install: ranlib /usr/local/lib/libusb.a
```

```
libtool: finish:
```

```
PATH="/usr/kerberos/sbin:/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/arci/bin:/sbin" ldconfig -n /usr/local/lib
```

```
-----  
Libraries have been installed in:
```

```
  /usr/local/lib
```

If you ever happen to want to link against installed libraries in a given directory, LIBDIR, you must either use libtool, and specify the full pathname of the library, or use the `-LLIBDIR` flag during linking and do at least one of the following:

- add LIBDIR to the `LD_LIBRARY_PATH` environment variable during execution
- add LIBDIR to the `LD_RUN_PATH` environment variable during linking
- use the `-Wl,-rpath -Wl,LIBDIR` linker flag
- have your system administrator add LIBDIR to `/etc/ld.so.conf`

See any operating system documentation about shared libraries for more information, such as the `ld(1)` and `ld.so(8)` manual pages.

```
-----  
test -z "/usr/local/include" || /bin/mkdir -p "/usr/local/include"
```

```
/usr/bin/install -c -m 644 'usb.h' '/usr/local/include/usb.h'
```

```
make[2]: Leaving directory `/home/arci/libusb-compat-0.1.3/libusb'
```

```
make[1]: Leaving directory `/home/arci/libusb-compat-0.1.3/libusb'
```

```
make[1]: Entering directory `/home/arci/libusb-compat-0.1.3'
```

```
make[2]: Entering directory `/home/arci/libusb-compat-0.1.3'
```

```
test -z "/usr/local/bin" || /bin/mkdir -p "/usr/local/bin"
```

```
/usr/bin/install -c 'libusb-config' '/usr/local/bin/libusb-config'
```

```
test -z "/usr/local/lib/pkgconfig" || /bin/mkdir -p "/usr/local/lib/pkgconfig"
```

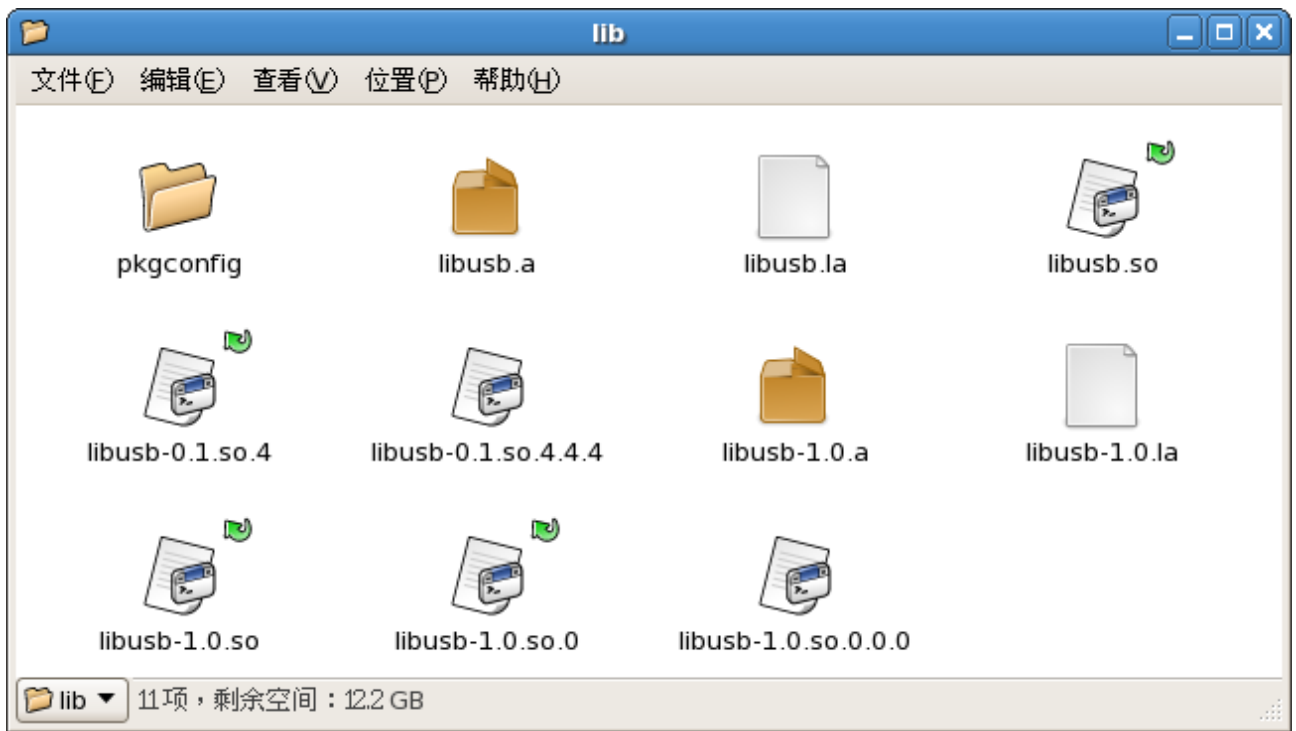
```
/usr/bin/install -c -m 644 'libusb.pc' '/usr/local/lib/pkgconfig/libusb.pc'
```

```
make[2]: Leaving directory `/home/arci/libusb-compat-0.1.3'
```

```
make[1]: Leaving directory `/home/arci/libusb-compat-0.1.3'
```

```
[root@localhost libusb-compat-0.1.3]#
```

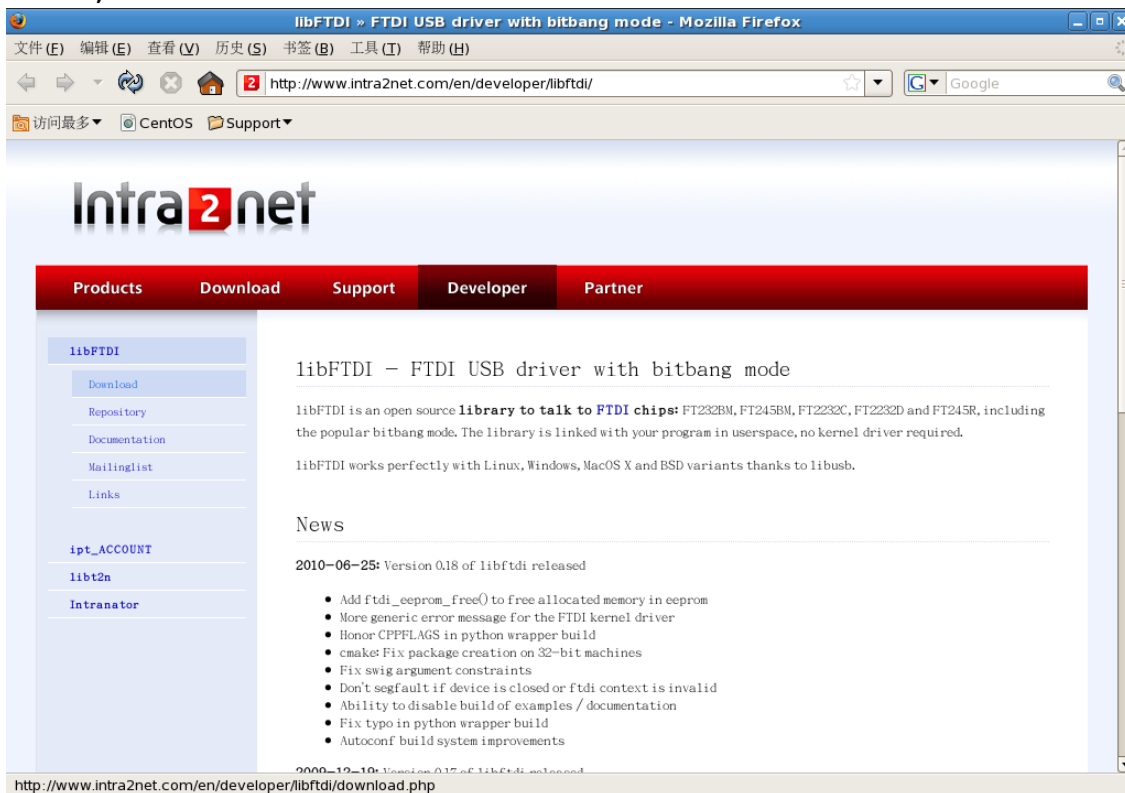
libusb-compat-0.1.3 安装到了“/usr/local/lib/”目录中。



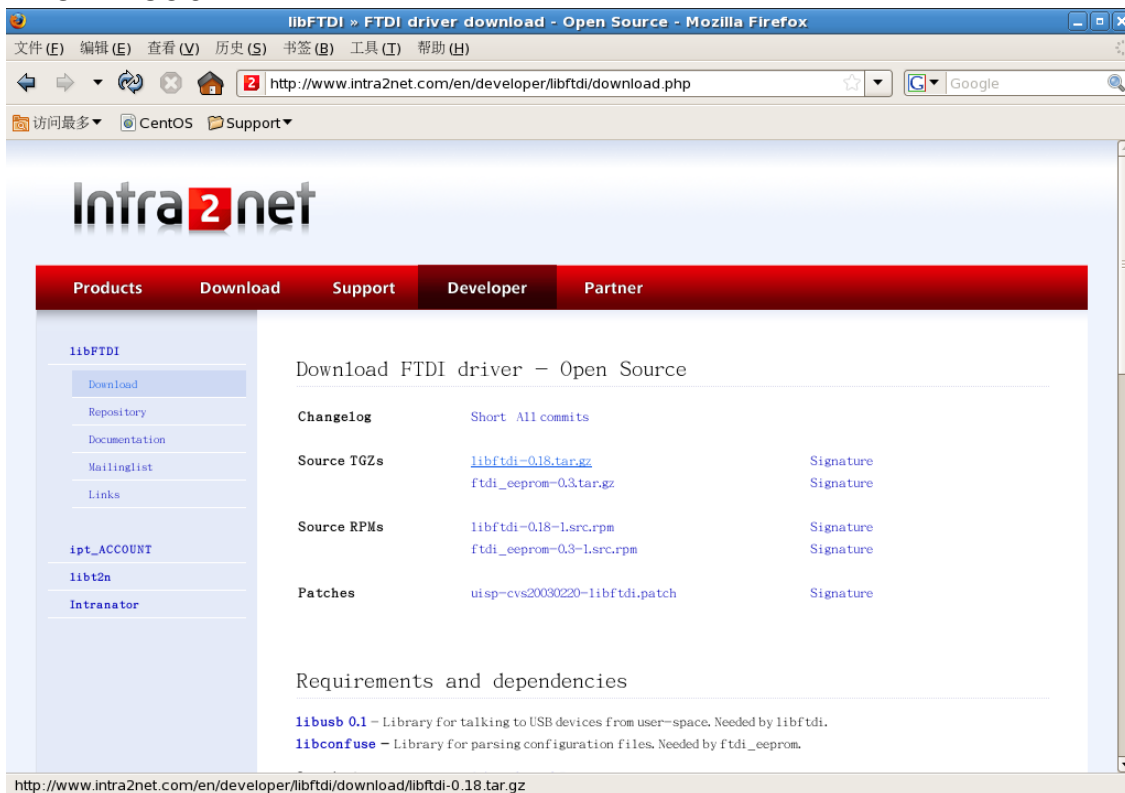
libusb 安装完成

4.2、编译安装 libftdi

libFTDI is an open source library to talk to FTDI chips: FT232BM, FT245BM, FT2232C, FT2232D and FT245R, including the popular bitbang mode. The library is linked with your program in userspace, no kernel driver required. libFTDI works perfectly with Linux, Windows, MacOS X and BSD variants thanks to libusb.



点击“Download”



点击“libftdi-0.18.tar.gz”下载

解压“libftdi-0.18.tar.gz”到当前用户主目录
打开终端，运行“./configure”

```
[root@localhost libftdi-0.18]# ./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... /bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
checking for gcc... gcc
checking for C compiler default output file name... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
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 for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking build system type... i686-pc-linux-gnu
checking host system type... i686-pc-linux-gnu
checking for a sed that does not truncate output... /bin/sed
checking for grep that handles long lines and -e... /bin/grep
checking for egrep... /bin/grep -E
checking for fgrep... /bin/grep -F
checking for ld used by gcc... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking for BSD- or MS-compatible name lister (nm)... /usr/bin/nm -B
checking the name lister (/usr/bin/nm -B) interface... BSD nm
checking whether ln -s works... yes
checking the maximum length of command line arguments... 98304
checking whether the shell understands some XSI constructs... yes
checking whether the shell understands "+="... yes
checking for /usr/bin/ld option to reload object files... -r
checking for objdump... objdump
checking how to recognize dependent libraries... pass_all
checking for ar... ar
checking for strip... strip
checking for ranlib... ranlib
checking command to parse /usr/bin/nm -B output from gcc object... ok
checking how to run the C preprocessor... gcc -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for unistd.h... yes
checking for dlfcn.h... yes
checking for objdir... .libs
checking if gcc supports -fno-rtti -fno-exceptions... no
checking for gcc option to produce PIC... -fPIC -DPIC
checking if gcc PIC flag -fPIC -DPIC works... yes
checking if gcc static flag -static works... yes
checking if gcc supports -c -o file.o... yes
```

checking if gcc supports -c -o file.o... (cached) yes
checking whether the gcc linker (/usr/bin/ld) supports shared libraries... yes
checking whether -lc should be explicitly linked in... no
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... yes
checking whether to build static libraries... yes
checking for g++... g++
checking whether we are using the GNU C++ compiler... yes
checking whether g++ accepts -g... yes
checking dependency style of g++... gcc3
checking whether we are using the GNU C++ compiler... (cached) yes
checking whether g++ accepts -g... (cached) yes
checking dependency style of g++... (cached) gcc3
checking how to run the C++ preprocessor... g++ -E
checking for ld used by g++... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking whether the g++ linker (/usr/bin/ld) supports shared libraries... yes
checking for g++ option to produce PIC... -fPIC -DPIC
checking if g++ PIC flag -fPIC -DPIC works... yes
checking if g++ static flag -static works... yes
checking if g++ supports -c -o file.o... yes
checking if g++ supports -c -o file.o... (cached) yes
checking whether the g++ linker (/usr/bin/ld) supports shared libraries... yes
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking for libusb-config... libusb-config
checking if libusb version is >= 0.1.7... yes
checking for boostlib >= 1.33... configure: We could not detect the boost libraries (version 1.33 or higher). If you have a staged boost library (still not installed) please specify \$BOOST_ROOT in your environment and do not give a PATH to --with-boost option. If you are sure you have boost installed, then check your version number looking in <boost/version.hpp>. See <http://randspringer.de/boost> for more documentation.
checking if we can build the C++ wrapper... no
checking for doxygen... /usr/bin/doxygen
checking for swig... /usr/bin/swig
checking for a Python interpreter with version >= 2.0... python
checking for python... /usr/bin/python
checking for python version... 2.4
checking for python platform... linux2
checking for python script directory... \${prefix}/lib/python2.4/site-packages
checking for python extension module directory... \${exec_prefix}/lib/python2.4/site-packages
checking /usr/include/python2.4/Python.h usability... no
checking /usr/include/python2.4/Python.h presence... no
checking for /usr/include/python2.4/Python.h... no
configure: WARNING: Python.h header file not found. Python development files are required to build presage python binding. Python can be obtained from <http://www.python.org>
configure: Python binding for libftdi will not be built.
configure: Enable Python binding module building with --enable-python-binding
configure: creating ./config.status
config.status: creating libftdi-config
config.status: creating Makefile
config.status: creating src/Makefile
config.status: creating bindings/Makefile
config.status: creating bindings/python/Makefile

```
config.status: creating bindings/python/setup.py
config.status: creating examples/Makefile
config.status: creating doc/Doxyfile
config.status: creating doc/Makefile
config.status: creating libftdi.pc
config.status: creating libftdi.spec
config.status: creating config.h
config.status: executing depfiles commands
config.status: executing libtool commands
[root@localhost libftdi-0.18]#
运行"make"
[root@localhost libftdi-0.18]# make
make all-recursive
make[1]: Entering directory `/home/arci/libftdi-0.18'
Making all in src
make[2]: Entering directory `/home/arci/libftdi-0.18/src'
/bin/sh ../libtool --tag=CC --mode=compile gcc -DHAVE_CONFIG_H -I. -I. -g -O2
-I/usr/local/include -MT ftdi.lo -MD -MP -MF .deps/ftdi.Tpo -c -o ftdi.lo ftdi.c
libtool: compile: gcc -DHAVE_CONFIG_H -I. -I. -g -O2 -I/usr/local/include -MT ftdi.lo -MD -MP
-MF .deps/ftdi.Tpo -c ftdi.c -fPIC -DPIC -o .libs/ftdi.o
libtool: compile: gcc -DHAVE_CONFIG_H -I. -I. -g -O2 -I/usr/local/include -MT ftdi.lo -MD -MP
-MF .deps/ftdi.Tpo -c ftdi.c -o ftdi.o >/dev/null 2>&1
mv -f .deps/ftdi.Tpo .deps/ftdi.Plo
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -version-info 19:0:18
-o libftdi.la -rpath /usr/local/lib ftdi.lo -L/usr/local/lib -lusb
libtool: link: gcc -shared .libs/ftdi.o -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-soname
-Wl,libftdi.so.1 -o .libs/libftdi.so.1.18.0
libtool: link: (cd ".libs" && rm -f "libftdi.so.1" && ln -s "libftdi.so.1.18.0" "libftdi.so.1")
libtool: link: (cd ".libs" && rm -f "libftdi.so" && ln -s "libftdi.so.1.18.0" "libftdi.so")
libtool: link: ar cru .libs/libftdi.a ftdi.o
libtool: link: ranlib .libs/libftdi.a
libtool: link: ( cd ".libs" && rm -f "libftdi.la" && ln -s "../libftdi.la" "libftdi.la" )
make[2]: Leaving directory `/home/arci/libftdi-0.18/src'
Making all in bindings
make[2]: Entering directory `/home/arci/libftdi-0.18/bindings'
Making all in python
make[3]: Entering directory `/home/arci/libftdi-0.18/bindings/python'
make all-am
make[4]: Entering directory `/home/arci/libftdi-0.18/bindings/python'
make[4]: Nothing to be done for `all-am'.
make[4]: Leaving directory `/home/arci/libftdi-0.18/bindings/python'
make[3]: Leaving directory `/home/arci/libftdi-0.18/bindings/python'
make[3]: Entering directory `/home/arci/libftdi-0.18/bindings'
make[3]: Nothing to be done for `all-am'.
make[3]: Leaving directory `/home/arci/libftdi-0.18/bindings'
make[2]: Leaving directory `/home/arci/libftdi-0.18/bindings'
Making all in examples
make[2]: Entering directory `/home/arci/libftdi-0.18/examples'
gcc -DHAVE_CONFIG_H -I. -I. -I../src -I../ftdipp -g -O2 -I/usr/local/include -MT simple.o -MD
-MP -MF .deps/simple.Tpo -c -o simple.o simple.c
mv -f .deps/simple.Tpo .deps/simple.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o simple
simple.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o simple simple.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I../src -I../ftdipp -g -O2 -I/usr/local/include -MT bitbang.o
-MD -MP -MF .deps/bitbang.Tpo -c -o bitbang.o bitbang.c
```



```

mv -f .deps/bitbang.Tpo .deps/bitbang.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
bitbang bitbang.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o bitbang bitbang.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT bitbang2.o
-MD -MP -MF .deps/bitbang2.Tpo -c -o bitbang2.o bitbang2.c
mv -f .deps/bitbang2.Tpo .deps/bitbang2.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
bitbang2 bitbang2.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o bitbang2 bitbang2.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT
bitbang_ft2232.o -MD -MP -MF .deps/bitbang_ft2232.Tpo -c -o bitbang_ft2232.o
bitbang_ft2232.c
mv -f .deps/bitbang_ft2232.Tpo .deps/bitbang_ft2232.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
bitbang_ft2232 bitbang_ft2232.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o bitbang_ft2232 bitbang_ft2232.o
../src/.libs/libftdi.so -L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt
-pthread -Wl,-rpath -Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath
-Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT
bitbang_cbus.o -MD -MP -MF .deps/bitbang_cbus.Tpo -c -o bitbang_cbus.o bitbang_cbus.c
mv -f .deps/bitbang_cbus.Tpo .deps/bitbang_cbus.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
bitbang_cbus bitbang_cbus.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o bitbang_cbus bitbang_cbus.o
../src/.libs/libftdi.so -L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt
-pthread -Wl,-rpath -Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath
-Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT find_all.o -MD
-MP -MF .deps/find_all.Tpo -c -o find_all.o find_all.c
mv -f .deps/find_all.Tpo .deps/find_all.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
find_all find_all.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o find_all find_all.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT serial_read.o
-MD -MP -MF .deps/serial_read.Tpo -c -o serial_read.o serial_read.c
mv -f .deps/serial_read.Tpo .deps/serial_read.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
serial_read serial_read.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o serial_read serial_read.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT baud_test.o
-MD -MP -MF .deps/serial_read.Tpo -c -o serial_read.o serial_read.c
mv -f .deps/serial_read.Tpo .deps/serial_read.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
serial_read serial_read.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o serial_read serial_read.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT baud_test.o
-MD -MP -MF .deps/serial_read.Tpo -c -o serial_read.o serial_read.c
mv -f .deps/serial_read.Tpo .deps/serial_read.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
serial_read serial_read.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o serial_read serial_read.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
gcc -DHAVE_CONFIG_H -I. -I. -I./src -I./ftdipp -g -O2 -I/usr/local/include -MT baud_test.o
-MD -MP -MF .deps/serial_read.Tpo -c -o serial_read.o serial_read.c
mv -f .deps/serial_read.Tpo .deps/serial_read.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -g -O2 -I/usr/local/include -no-install -o
baud_test baud_test.o ../src/libftdi.la -L/usr/local/lib -lusb
libtool: link: gcc -g -O2 -I/usr/local/include -o baud_test baud_test.o ../src/.libs/libftdi.so
-L/usr/local/lib /usr/local/lib/libusb.so /usr/local/lib/libusb-1.0.so -lrt -pthread -Wl,-rpath
-Wl,/home/arci/libftdi-0.18/src/.libs -Wl,-rpath -Wl,/usr/local/lib -Wl,-rpath -Wl,/usr/local/lib
make[2]: Leaving directory `/home/arci/libftdi-0.18/examples'
Making all in doc

```

```
make[2]: Entering directory `/home/arci/libftdi-0.18/doc'
/usr/bin/doxygen
Searching for include files...
Searching for example files...
Searching for images...
Searching for dot files...
Searching for files to exclude
Searching for files to process...
Reading and parsing tag files
Preprocessing /home/arci/libftdi-0.18/src/ftdi.c...
Parsing file /home/arci/libftdi-0.18/src/ftdi.c...
Preprocessing /home/arci/libftdi-0.18/src/ftdi.h...
Parsing file /home/arci/libftdi-0.18/src/ftdi.h...
Preprocessing /home/arci/libftdi-0.18/ftdipp/ftdi.cpp...
Parsing file /home/arci/libftdi-0.18/ftdipp/ftdi.cpp...
Preprocessing /home/arci/libftdi-0.18/ftdipp/ftdi.hpp...
Parsing file /home/arci/libftdi-0.18/ftdipp/ftdi.hpp...
Building group list...
Building directory list...
Building namespace list...
Building file list...
Searching for included using directives...
Building class list...
Associating documentation with classes...
Computing nesting relations for classes...
Searching for members imported via using declarations...
Building example list...
Searching for documented variables...
Building member list...
Searching for friends...
Searching for documented defines...
Computing template instances...
Flushing cached template relations that have become invalid...
Creating members for template instances...
Computing class relations...
Searching for enumerations...
Searching for member function documentation...
/home/arci/libftdi-0.18/ftdipp/ftdi.cpp:275: Warning: documented function `int
Ftdi::Context::bitbang_enable' was not defined.
Building page list...
Search for main page...
Computing page relations...
Determining the scope of groups...
Sorting lists...
Freeing entry tree
Determining which enums are documented
Computing member relations...
Building full member lists recursively..
Adding members to member groups.
Computing member references...
Inheriting documentation...
Generating disk names...
Adding source references...
Adding todo/test/bug list items...
Generating style sheet...
Counting data structures...
Resolving user defined references...
Combining using relations...
Finding anchors and sections in the documentation...
```

Generating index page...
Generating example documentation...
Generating file sources...
Generating code for file ftdi.c...
Generating code for file ftdi.cpp...
Generating code for file ftdi.h...
Generating code for file ftdi.hpp...
Generating file documentation...
Generating docs for file ftdi.c...
Generating docs for file ftdi.cpp...
Generating docs for file ftdi.h...
Generating docs for file ftdi.hpp...
Generating page documentation...
Generating docs for page deprecated...
Generating group documentation...
Generating group index...
Generating class documentation...
Generating annotated compound index...
Generating hierarchical class index...
Generating member index...
Generating docs for compound ftdi_context...
Generating docs for compound ftdi_device_list...
Generating docs for compound ftdi_eeprom...
Generating docs for compound usb_dev_handle...
Generating namespace index...
Generating docs for namespace Ftdi
Generating docs for compound Ftdi::Context...
Generating docs for nested compound Ftdi::Context::Private...
Generating docs for compound Ftdi::Eeprom...
Generating docs for nested compound Ftdi::Eeprom::Private...
Generating docs for compound Ftdi::List...
Generating docs for nested compound Ftdi::List::Private...
Generating namespace member index...
Generating graph info page...
Generating file index...
Generating example index...
Generating file member index...
Generating page index...

```
make[2]: Leaving directory `/home/arci/libftdi-0.18/doc'
```

```
make[2]: Entering directory `/home/arci/libftdi-0.18'
```

```
make[2]: Nothing to be done for `all-am'.
```

```
make[2]: Leaving directory `/home/arci/libftdi-0.18'
```

```
make[1]: Leaving directory `/home/arci/libftdi-0.18'
```

```
[root@localhost libftdi-0.18]#
```

运行“make install”

```
[root@localhost libftdi-0.18]# make install
```

```
Making install in src
```

```
make[1]: Entering directory `/home/arci/libftdi-0.18/src'
```

```
make[2]: Entering directory `/home/arci/libftdi-0.18/src'
```

```
test -z "/usr/local/lib" || /bin/mkdir -p "/usr/local/lib"
```

```
/bin/sh ../libtool --mode=install /usr/bin/install -c libftdi.la '/usr/local/lib'
```

```
libtool: install: /usr/bin/install -c .libs/libftdi.so.1.18.0 /usr/local/lib/libftdi.so.1.18.0
```

```
libtool: install: (cd /usr/local/lib && { ln -s -f libftdi.so.1.18.0 libftdi.so.1 || { rm -f libftdi.so.1 && ln -s libftdi.so.1.18.0 libftdi.so.1; }; })
```

```
libtool: install: (cd /usr/local/lib && { ln -s -f libftdi.so.1.18.0 libftdi.so || { rm -f libftdi.so && ln -s libftdi.so.1.18.0 libftdi.so; }; })
```

```
libtool: install: /usr/bin/install -c .libs/libftdi.lai /usr/local/lib/libftdi.la
```

```
libtool: install: /usr/bin/install -c .libs/libftdi.a /usr/local/lib/libftdi.a
```

```
libtool: install: chmod 644 /usr/local/lib/libftdi.a
```

libtool: install: ranlib /usr/local/lib/libftdi.a

libtool: finish:

PATH="/usr/kerberos/sbin:/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/arci/bin:/sbin" ldconfig -n /usr/local/lib

Libraries have been installed in:

 /usr/local/lib

If you ever happen to want to link against installed libraries in a given directory, LIBDIR, you must either use libtool, and specify the full pathname of the library, or use the '-LLIBDIR' flag during linking and do at least one of the following:

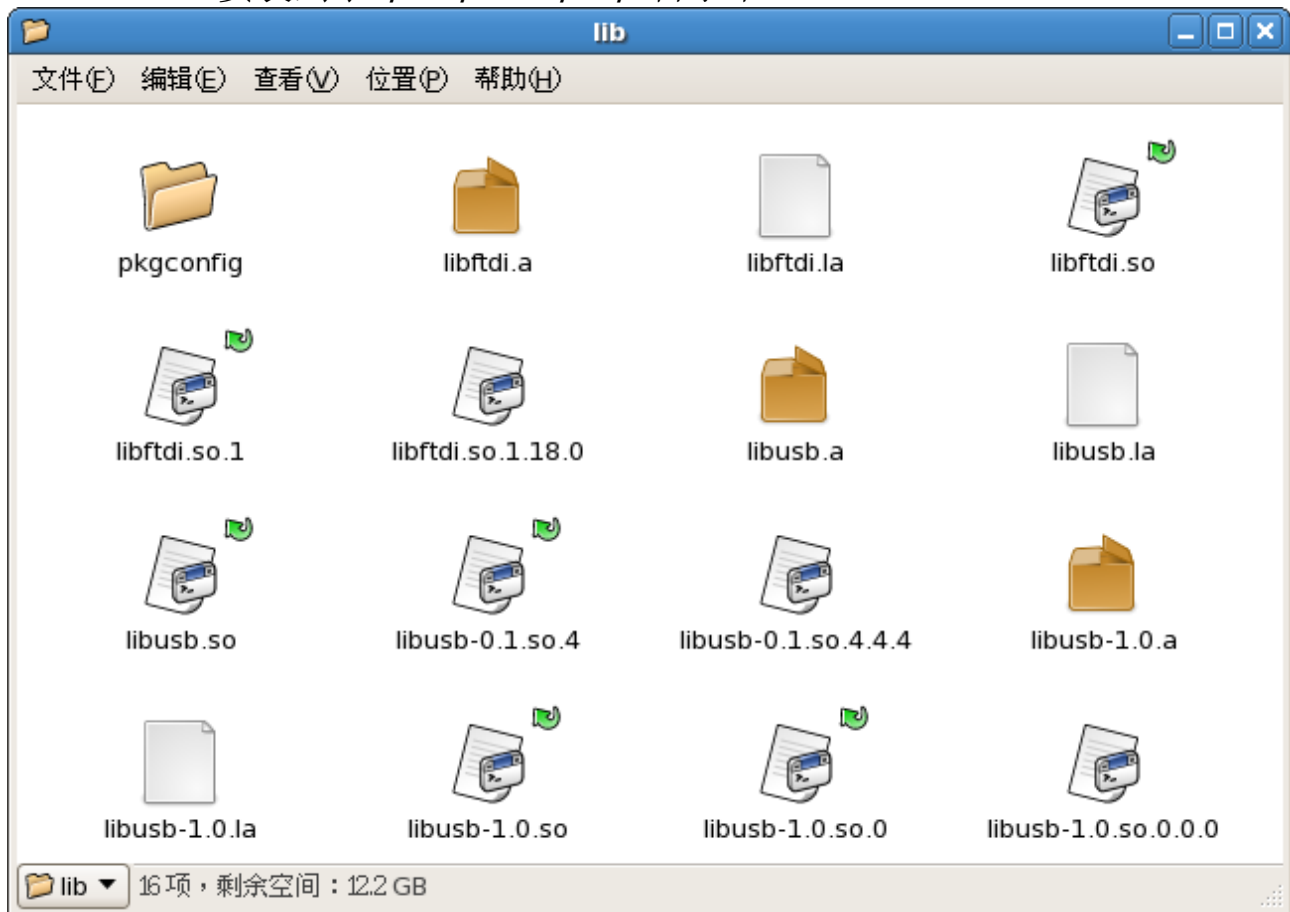
- add LIBDIR to the 'LD_LIBRARY_PATH' environment variable during execution
- add LIBDIR to the 'LD_RUN_PATH' environment variable during linking
- use the '-Wl,-rpath -Wl,LIBDIR' linker flag
- have your system administrator add LIBDIR to '/etc/ld.so.conf'

See any operating system documentation about shared libraries for more information, such as the ld(1) and ld.so(8) manual pages.

test -z "/usr/local/include" || /bin/mkdir -p "/usr/local/include"
/usr/bin/install -c -m 644 ftdi.h '/usr/local/include'
make[2]: Leaving directory '/home/arci/libftdi-0.18/src'
make[1]: Leaving directory '/home/arci/libftdi-0.18/src'
Making install in bindings
make[1]: Entering directory '/home/arci/libftdi-0.18/bindings'
Making install in python
make[2]: Entering directory '/home/arci/libftdi-0.18/bindings/python'
make install-am
make[3]: Entering directory '/home/arci/libftdi-0.18/bindings/python'
make[4]: Entering directory '/home/arci/libftdi-0.18/bindings/python'
make[4]: Nothing to be done for 'install-exec-am'.
make[4]: Nothing to be done for 'install-data-am'.
make[4]: Leaving directory '/home/arci/libftdi-0.18/bindings/python'
make[3]: Leaving directory '/home/arci/libftdi-0.18/bindings/python'
make[2]: Leaving directory '/home/arci/libftdi-0.18/bindings/python'
make[2]: Entering directory '/home/arci/libftdi-0.18/bindings'
make[3]: Entering directory '/home/arci/libftdi-0.18/bindings'
make[3]: Nothing to be done for 'install-exec-am'.
make[3]: Nothing to be done for 'install-data-am'.
make[3]: Leaving directory '/home/arci/libftdi-0.18/bindings'
make[2]: Leaving directory '/home/arci/libftdi-0.18/bindings'
make[1]: Leaving directory '/home/arci/libftdi-0.18/bindings'
Making install in examples
make[1]: Entering directory '/home/arci/libftdi-0.18/examples'
make[2]: Entering directory '/home/arci/libftdi-0.18/examples'
test -z "/usr/local/bin" || /bin/mkdir -p "/usr/local/bin"
 /bin/sh ../libtool --mode=install /usr/bin/install -c simple bitbang bitbang2 bitbang_ft2232
bitbang_cbus find_all serial_read baud_test '/usr/local/bin'
libtool: install: /usr/bin/install -c simple /usr/local/bin/simple
libtool: install: /usr/bin/install -c bitbang /usr/local/bin/bitbang
libtool: install: /usr/bin/install -c bitbang2 /usr/local/bin/bitbang2
libtool: install: /usr/bin/install -c bitbang_ft2232 /usr/local/bin/bitbang_ft2232
libtool: install: /usr/bin/install -c bitbang_cbus /usr/local/bin/bitbang_cbus
libtool: install: /usr/bin/install -c find_all /usr/local/bin/find_all
libtool: install: /usr/bin/install -c serial_read /usr/local/bin/serial_read
libtool: install: /usr/bin/install -c baud_test /usr/local/bin/baud_test

```
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/home/arci/libftdi-0.18/examples'
make[1]: Leaving directory `/home/arci/libftdi-0.18/examples'
Making install in doc
make[1]: Entering directory `/home/arci/libftdi-0.18/doc'
make[2]: Entering directory `/home/arci/libftdi-0.18/doc'
make[2]: Nothing to be done for `install-exec-am'.
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/home/arci/libftdi-0.18/doc'
make[1]: Leaving directory `/home/arci/libftdi-0.18/doc'
make[1]: Entering directory `/home/arci/libftdi-0.18'
make[2]: Entering directory `/home/arci/libftdi-0.18'
test -z "/usr/local/bin" || /bin/mkdir -p "/usr/local/bin"
/usr/bin/install -c libftdi-config '/usr/local/bin'
test -z "/usr/local/lib/pkgconfig" || /bin/mkdir -p "/usr/local/lib/pkgconfig"
/usr/bin/install -c -m 644 libftdi.pc '/usr/local/lib/pkgconfig'
make[2]: Leaving directory `/home/arci/libftdi-0.18'
make[1]: Leaving directory `/home/arci/libftdi-0.18'
[root@localhost libftdi-0.18]#
```

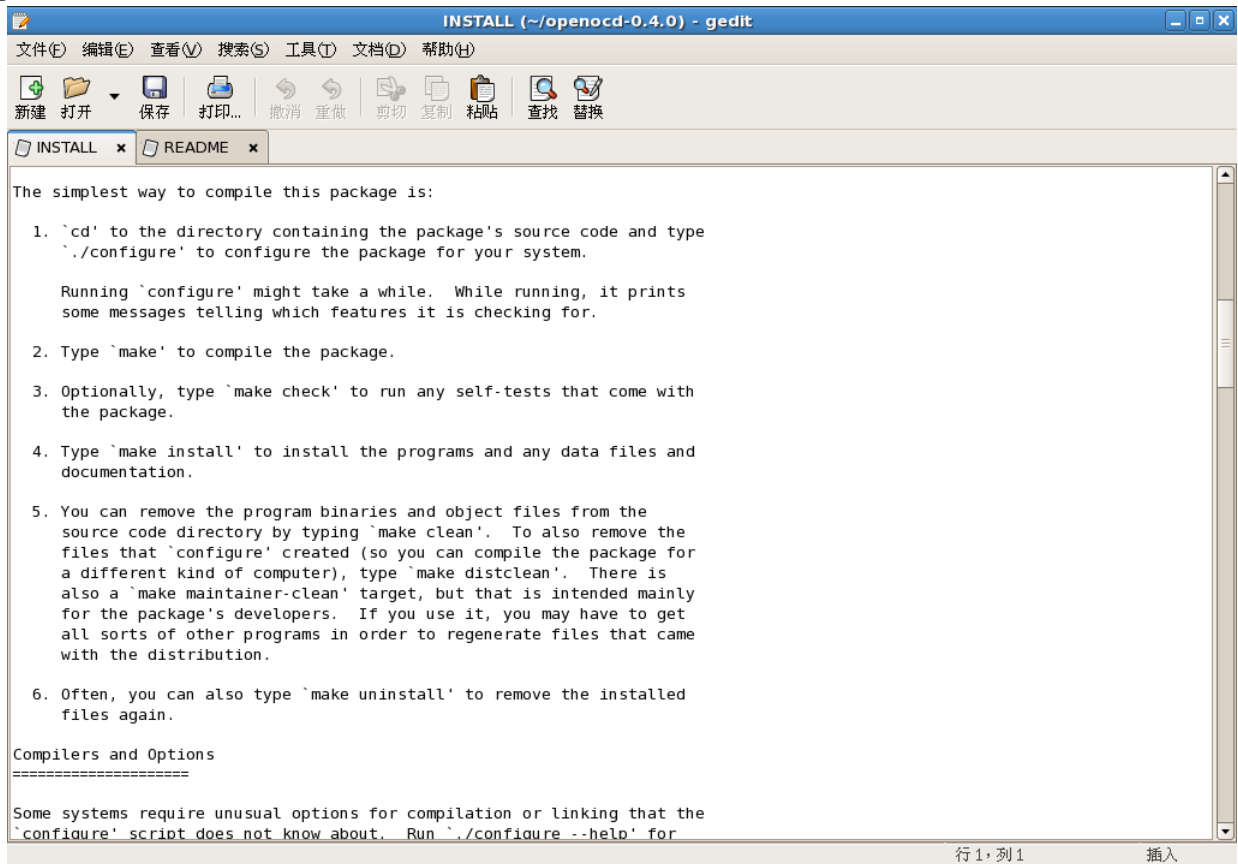
libftdi-0.18 安装到了“/usr/local/lib/”目录中。



libftdi 安装完成

4.3、编译安装 OpenOCD

打开 `openocd` 目录中的“README”和“INSTALL”文件，查看编译安装帮助信息。



The screenshot shows a gedit window titled "INSTALL (~/openocd-0.4.0) - gedit". The window contains the following text:

```
The simplest way to compile this package is:
```

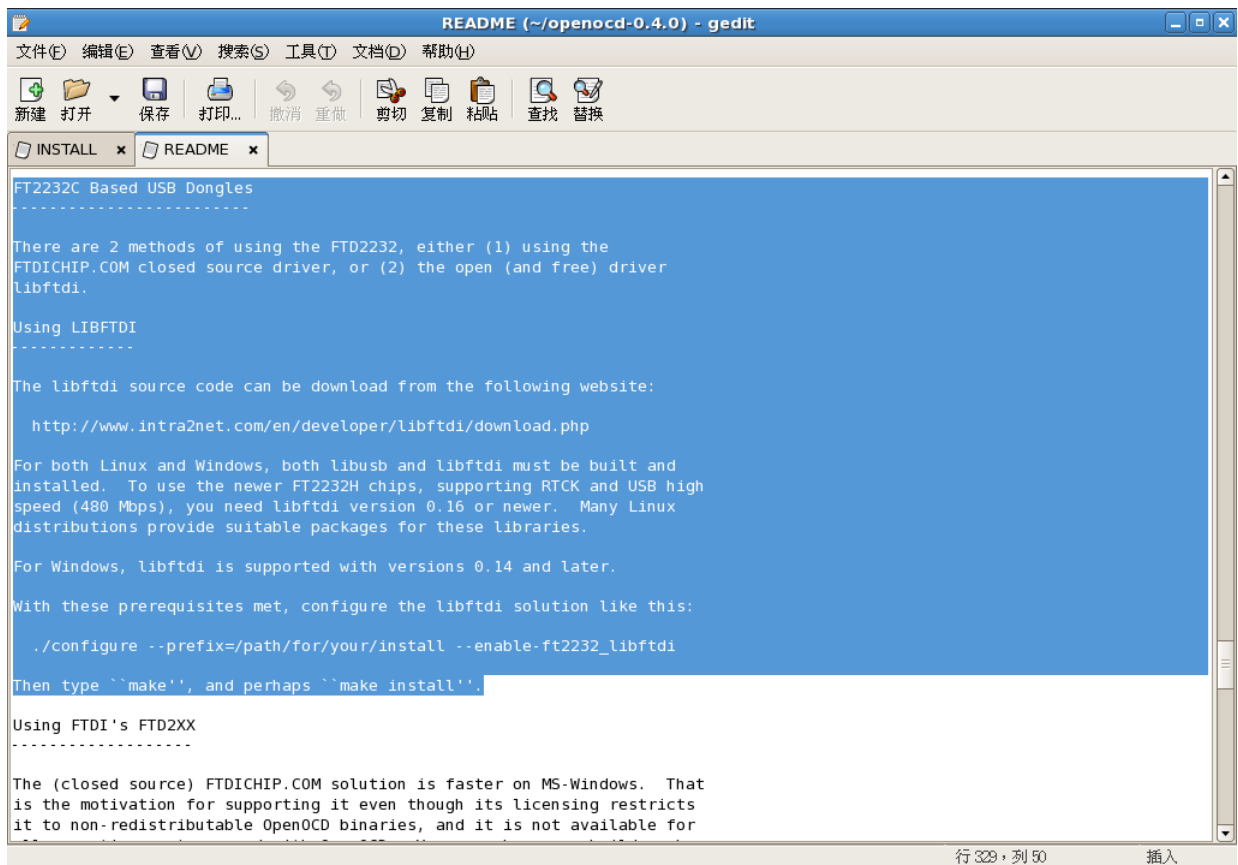
1. ``cd'` to the directory containing the package's source code and type ``.`configure'` to configure the package for your system.

Running ``configure'` might take a while. While running, it prints some messages telling which features it is checking for.
2. Type ``make'` to compile the package.
3. Optionally, type ``make check'` to run any self-tests that come with the package.
4. Type ``make install'` to install the programs and any data files and documentation.
5. You can remove the program binaries and object files from the source code directory by typing ``make clean'`. To also remove the files that ``configure'` created (so you can compile the package for a different kind of computer), type ``make distclean'`. There is also a ``make maintainer-clean'` target, but that is intended mainly for the package's developers. If you use it, you may have to get all sorts of other programs in order to regenerate files that came with the distribution.
6. Often, you can also type ``make uninstall'` to remove the installed files again.

Compilers and Options
=====

Some systems require unusual options for compilation or linking that the ``configure'` script does not know about. Run ``.`configure --help'` for

行 1, 列 1 插入



The screenshot shows a gedit window titled "README (~/openocd-0.4.0) - gedit". The window contains the following text:

```
FT2232C Based USB Dongles  
-----  
There are 2 methods of using the FTD2232, either (1) using the  
FTDICHIP.COM closed source driver, or (2) the open (and free) driver  
libftdi.  
  
Using LIBFTDI  
-----  
The libftdi source code can be download from the following website:  
  
http://www.intra2net.com/en/developer/libftdi/download.php  
  
For both Linux and Windows, both libusb and libftdi must be built and  
installed. To use the newer FT2232H chips, supporting RTCK and USB high  
speed (480 Mbps), you need libftdi version 0.16 or newer. Many Linux  
distributions provide suitable packages for these libraries.  
  
For Windows, libftdi is supported with versions 0.14 and later.  
  
With these prerequisites met, configure the libftdi solution like this:  
  
`.`configure --prefix=/path/for/your/install --enable-ft2232_libftdi  
Then type `make', and perhaps `make install'.  
  
Using FTDI's FTD2XX  
-----  
The (closed source) FTDICHIP.COM solution is faster on MS-Windows. That  
is the motivation for supporting it even though its licensing restricts  
it to non-redistributable OpenOCD binaries, and it is not available for
```

行 329, 列 50 插入

打开终端，运行“./configure --enable-ft2232_libftdi”

```
[root@localhost openocd-0.4.0]# ./configure --enable-ft2232_libftdi
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... gawk
checking whether make sets $(MAKE)... yes
checking whether to enable maintainer-specific portions of Makefiles... no
checking for gcc... gcc
checking for C compiler default output file name... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
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 for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking for gcc option to accept ISO C99... -std=gnu99
checking whether gcc -std=gnu99 and cc understand -c and -o together... yes
checking for ranlib... ranlib
checking build system type... i686-pc-linux-gnu
checking host system type... i686-pc-linux-gnu
checking for a sed that does not truncate output... /bin/sed
checking for grep that handles long lines and -e... /bin/grep
checking for egrep... /bin/grep -E
checking for fgrep... /bin/grep -F
checking for ld used by gcc -std=gnu99... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking for BSD- or MS-compatible name lister (nm)... /usr/bin/nm -B
checking the name lister (/usr/bin/nm -B) interface... BSD nm
checking whether ln -s works... yes
checking the maximum length of command line arguments... 98304
checking whether the shell understands some XSI constructs... yes
checking whether the shell understands "+="... yes
checking for /usr/bin/ld option to reload object files... -r
checking how to recognize dependent libraries... pass_all
checking for ar... ar
checking for strip... strip
checking for ranlib... (cached) ranlib
checking command to parse /usr/bin/nm -B output from gcc -std=gnu99 object... ok
checking how to run the C preprocessor... gcc -std=gnu99 -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for unistd.h... yes
checking for dlfcn.h... yes
checking for objdir... .libs
checking if gcc -std=gnu99 supports -fno-rtti -fno-exceptions... no
checking for gcc -std=gnu99 option to produce PIC... -fPIC -DPIC
checking if gcc -std=gnu99 PIC flag -fPIC -DPIC works... yes
checking if gcc -std=gnu99 static flag -static works... yes
```

checking if gcc -std=gnu99 supports -c -o file.o... yes
checking if gcc -std=gnu99 supports -c -o file.o... (cached) yes
checking whether the gcc -std=gnu99 linker (/usr/bin/ld) supports shared libraries... yes
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... no
checking whether to build static libraries... yes
checking for an ANSI C-conforming const... yes
checking for long long int... yes
checking for library containing ioperm... none required
checking for library containing dlopen... -ldl
checking sys/socket.h usability... yes
checking sys/socket.h presence... yes
checking for sys/socket.h... yes
checking for arpa/inet.h... yes
checking elf.h usability... yes
checking elf.h presence... yes
checking for elf.h... yes
checking dirent.h usability... yes
checking dirent.h presence... yes
checking for dirent.h... yes
checking fcntl.h usability... yes
checking fcntl.h presence... yes
checking for fcntl.h... yes
checking for ifaddrs.h... yes
checking malloc.h usability... yes
checking malloc.h presence... yes
checking for malloc.h... yes
checking netdb.h usability... yes
checking netdb.h presence... yes
checking for netdb.h... yes
checking for netinet/in.h... yes
checking for netinet/tcp.h... yes
checking pthread.h usability... yes
checking pthread.h presence... yes
checking for pthread.h... yes
checking for strings.h... (cached) yes
checking sys/ioctl.h usability... yes
checking sys/ioctl.h presence... yes
checking for sys/ioctl.h... yes
checking sys/param.h usability... yes
checking sys/param.h presence... yes
checking for sys/param.h... yes
checking sys/poll.h usability... yes
checking sys/poll.h presence... yes
checking for sys/poll.h... yes
checking sys/select.h usability... yes
checking sys/select.h presence... yes
checking for sys/select.h... yes
checking for sys/stat.h... (cached) yes
checking sys/time.h usability... yes
checking sys/time.h presence... yes
checking for sys/time.h... yes
checking for sys/types.h... (cached) yes
checking for unistd.h... (cached) yes
checking for net/if.h... yes
checking whether to enable assertions... yes

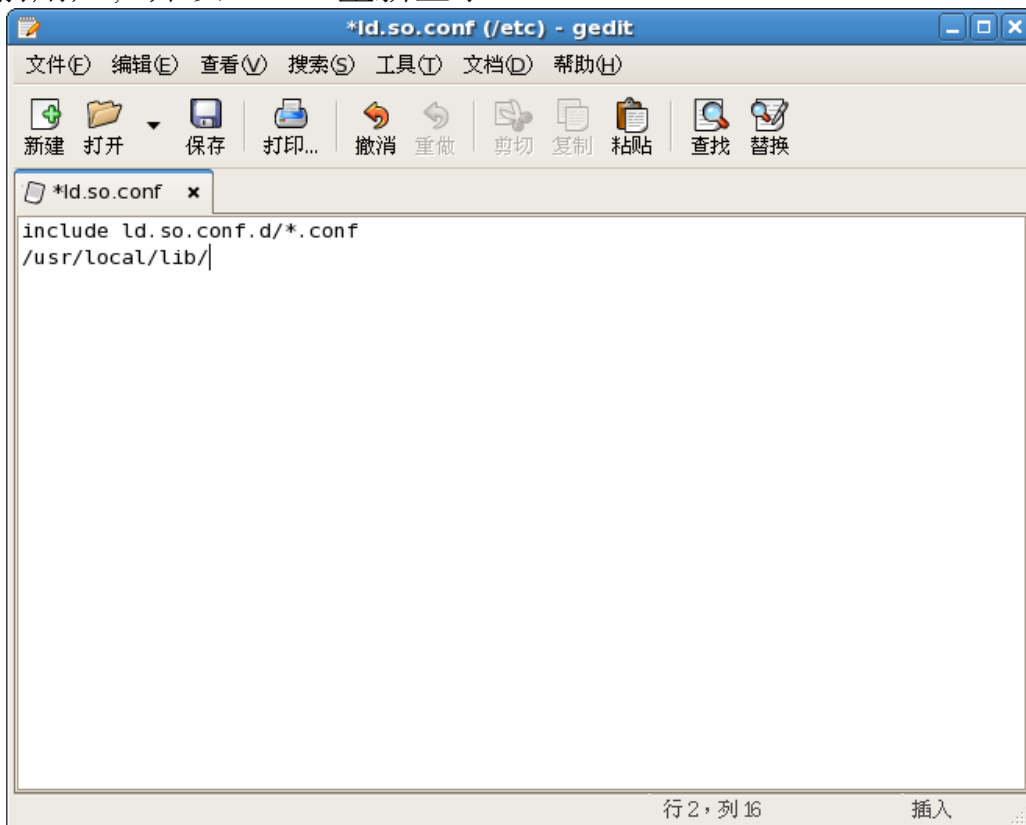

```
checking for stdbool.h that conforms to C99... yes
checking for _Bool... yes
checking whether time.h and sys/time.h may both be included... yes
checking whether byte ordering is bigendian... no
checking for strndup... yes
checking for strlen... yes
checking for gettimeofday... yes
checking for usleep... yes
checking for vasprintf... yes
checking for "./guess-rev.sh"... no
checking whether to build a release... yes
checking whether to build Doxygen as HTML... yes
checking whether to build Doxygen as PDF... no
checking whether to enable verbose JTAG I/O messages... no
checking whether to enable verbose USB I/O messages... no
checking whether to enable verbose USB communication messages... no
checking whether to enable malloc free space logging... no
checking whether to enable ZY1000 minidriver... no
checking whether to enable dummy minidriver... no
checking whether standard drivers can be built... yes
checking Build & Link with libftdi..... configure: error: Cannot build & run test program
using libftdi
```

```
[root@localhost openocd-0.4.0]#
```

此错误是由于未能找到“libftdi”库引起的。

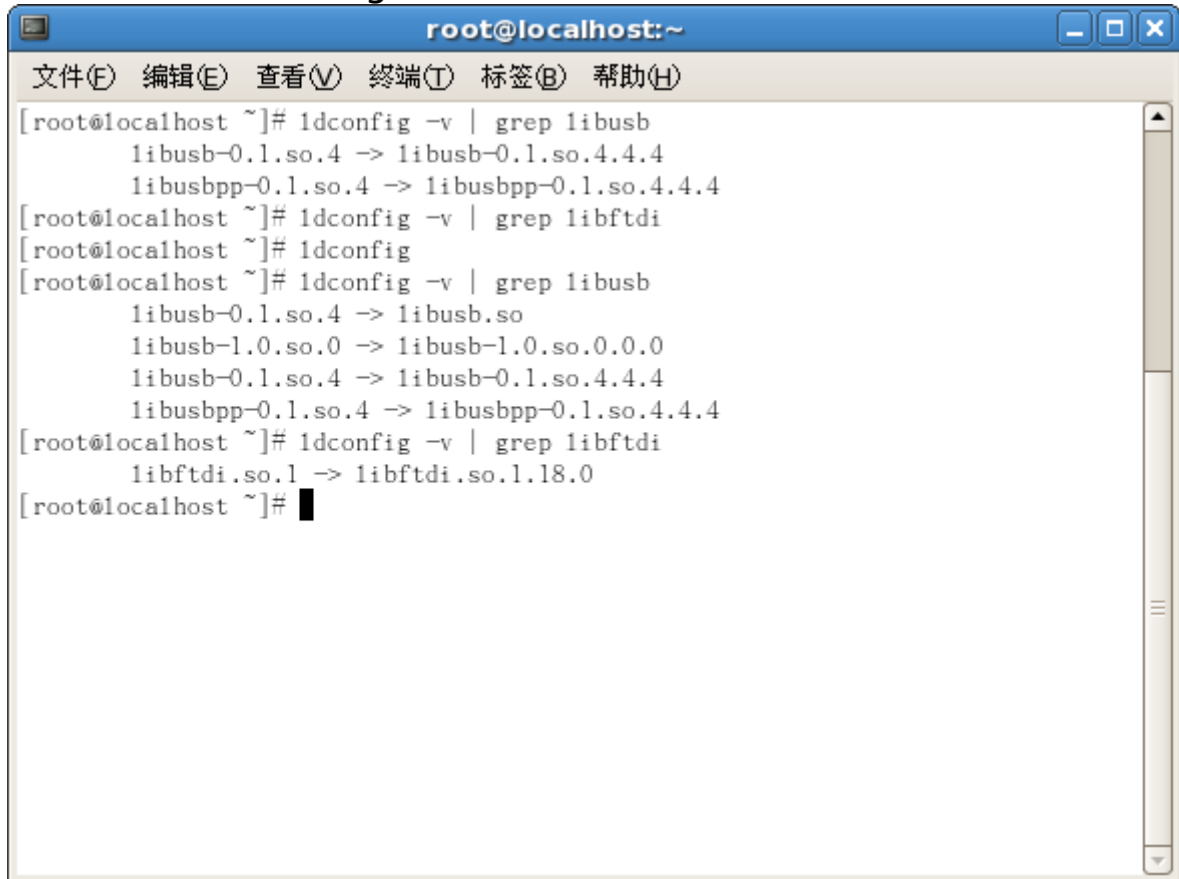
此处使用“export”命令修改环境变量“PKG_CONFIG_PATH”，将“libftdi”安装目录下的“pkgconfig”目录添加到环境变量“PKG_CONFIG_PATH”中，不能解决问题。可以将“libftdi”库安装目录添加到linux共享库中，即将“/usr/local/lib/”目录添加到“/etc/ld.so.conf”中，并执行“ldconfig”更新“ld.so.cache”，使用此方法必须登录“root”帐户才能进行。

注销当前用户，并以“root”重新登录



打开“/etc/ld.so.conf”在其中添加“/usr/local/lib/”并保存。

打开终端，执行“ldconfig”更新“ld.so.cache”



```
root@localhost:~
文件(F) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)
[root@localhost ~]# ldconfig -v | grep libusb
    libusb-0.1.so.4 -> libusb-0.1.so.4.4.4
    libusbpp-0.1.so.4 -> libusbpp-0.1.so.4.4.4
[root@localhost ~]# ldconfig -v | grep libftdi
[root@localhost ~]# ldconfig
[root@localhost ~]# ldconfig -v | grep libusb
    libusb-0.1.so.4 -> libusb.so
    libusb-1.0.so.0 -> libusb-1.0.so.0.0.0
    libusb-0.1.so.4 -> libusb-0.1.so.4.4.4
    libusbpp-0.1.so.4 -> libusbpp-0.1.so.4.4.4
[root@localhost ~]# ldconfig -v | grep libftdi
    libftdi.so.1 -> libftdi.so.1.18.0
[root@localhost ~]#
```

注销“root”帐户，以普通帐户重新登录

打开终端，运行“su”，并输入 root 帐户密码

重新运行“./configure --enable-ft2232_libftdi”

```
[arci@localhost openocd-0.4.0]$ su
```

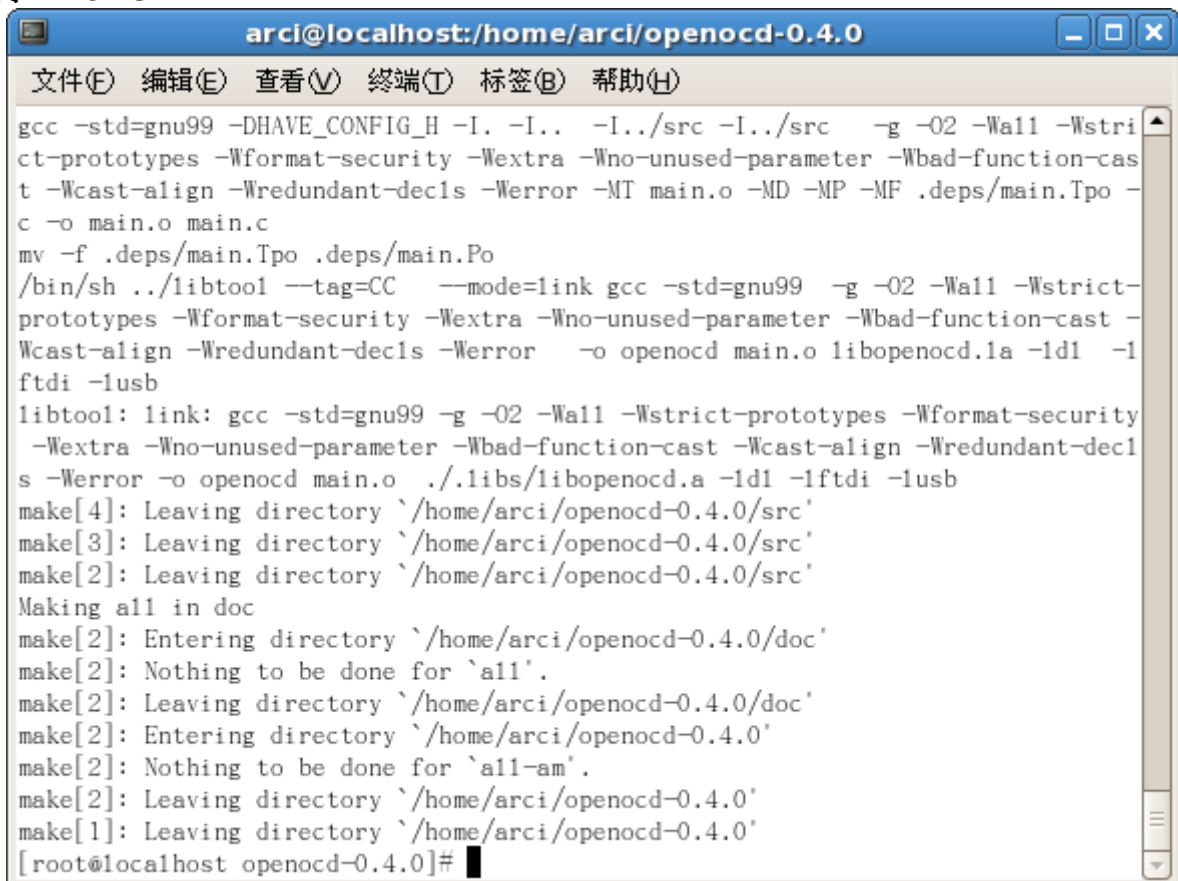
口令:

```
[root@localhost openocd-0.4.0]# ./configure --enable-ft2232_libftdi
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... gawk
checking whether make sets $(MAKE)... yes
checking whether to enable maintainer-specific portions of Makefiles... no
checking for gcc... gcc
checking for C compiler default output file name... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
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 for style of include used by make... GNU
checking dependency style of gcc... gcc3
checking for gcc option to accept ISO C99... -std=gnu99
checking whether gcc -std=gnu99 and cc understand -c and -o together... yes
checking for ranlib... ranlib
checking build system type... i686-pc-linux-gnu
checking host system type... i686-pc-linux-gnu
checking for a sed that does not truncate output... /bin/sed
checking for grep that handles long lines and -e... /bin/grep
```

checking for egrep... /bin/grep -E
checking for fgrep... /bin/grep -F
checking for ld used by gcc -std=gnu99... /usr/bin/ld
checking if the linker (/usr/bin/ld) is GNU ld... yes
checking for BSD- or MS-compatible name lister (nm)... /usr/bin/nm -B
checking the name lister (/usr/bin/nm -B) interface... BSD nm
checking whether ln -s works... yes
checking the maximum length of command line arguments... 98304
checking whether the shell understands some XSI constructs... yes
checking whether the shell understands "+="... yes
checking for /usr/bin/ld option to reload object files... -r
checking how to recognize dependent libraries... pass_all
checking for ar... ar
checking for strip... strip
checking for ranlib... (cached) ranlib
checking command to parse /usr/bin/nm -B output from gcc -std=gnu99 object... ok
checking how to run the C preprocessor... gcc -std=gnu99 -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for memory.h... yes
checking for strings.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for unistd.h... yes
checking for dlfcn.h... yes
checking for objdir... .libs
checking if gcc -std=gnu99 supports -fno-rtti -fno-exceptions... no
checking for gcc -std=gnu99 option to produce PIC... -fPIC -DPIC
checking if gcc -std=gnu99 PIC flag -fPIC -DPIC works... yes
checking if gcc -std=gnu99 static flag -static works... yes
checking if gcc -std=gnu99 supports -c -o file.o... yes
checking if gcc -std=gnu99 supports -c -o file.o... (cached) yes
checking whether the gcc -std=gnu99 linker (/usr/bin/ld) supports shared libraries... yes
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... no
checking whether to build static libraries... yes
checking for an ANSI C-conforming const... yes
checking for long long int... yes
checking for library containing ioperm... none required
checking for library containing dlopen... -ldl
checking sys/socket.h usability... yes
checking sys/socket.h presence... yes
checking for sys/socket.h... yes
checking for arpa/inet.h... yes
checking elf.h usability... yes
checking elf.h presence... yes
checking for elf.h... yes
checking dirent.h usability... yes
checking dirent.h presence... yes
checking for dirent.h... yes
checking fcntl.h usability... yes
checking fcntl.h presence... yes
checking for fcntl.h... yes

checking for ifaddrs.h... yes
checking malloc.h usability... yes
checking malloc.h presence... yes
checking for malloc.h... yes
checking netdb.h usability... yes
checking netdb.h presence... yes
checking for netdb.h... yes
checking for netinet/in.h... yes
checking for netinet/tcp.h... yes
checking pthread.h usability... yes
checking pthread.h presence... yes
checking for pthread.h... yes
checking for strings.h... (cached) yes
checking sys/ioctl.h usability... yes
checking sys/ioctl.h presence... yes
checking for sys/ioctl.h... yes
checking sys/param.h usability... yes
checking sys/param.h presence... yes
checking for sys/param.h... yes
checking sys/poll.h usability... yes
checking sys/poll.h presence... yes
checking for sys/poll.h... yes
checking sys/select.h usability... yes
checking sys/select.h presence... yes
checking for sys/select.h... yes
checking for sys/stat.h... (cached) yes
checking sys/time.h usability... yes
checking sys/time.h presence... yes
checking for sys/time.h... yes
checking for sys/types.h... (cached) yes
checking for unistd.h... (cached) yes
checking for net/if.h... yes
checking whether to enable assertions... yes
checking for stdbool.h that conforms to C99... yes
checking for _Bool... yes
checking whether time.h and sys/time.h may both be included... yes
checking whether byte ordering is bigendian... no
checking for strndup... yes
checking for strnlen... yes
checking for gettimeofday... yes
checking for usleep... yes
checking for vasprintf... yes
checking for "./guess-rev.sh"... no
checking whether to build a release... yes
checking whether to build Doxygen as HTML... yes
checking whether to build Doxygen as PDF... no
checking whether to enable verbose JTAG I/O messages... no
checking whether to enable verbose USB I/O messages... no
checking whether to enable verbose USB communication messages... no
checking whether to enable malloc free space logging... no
checking whether to enable ZY1000 minidriver... no
checking whether to enable dummy minidriver... no
checking whether standard drivers can be built... yes
checking Build & Link with libftdi..... Success
checking for libftdi highspeed device support... yes
checking for environ in unistd.h and stdlib.h... yes
checking for a C compiler for build tools... gcc -std=gnu99
checking for suffix of executable build tools...
configure: creating ./config.status

config.status: creating Makefile
config.status: creating src/Makefile
config.status: creating src/helper/Makefile
config.status: creating src/jtag/Makefile
config.status: creating src/jtag/drivers/Makefile
config.status: creating src/xsvf/Makefile
config.status: creating src/svf/Makefile
config.status: creating src/target/Makefile
config.status: creating src/server/Makefile
config.status: creating src/flash/Makefile
config.status: creating src/flash/nor/Makefile
config.status: creating src/flash/nand/Makefile
config.status: creating src/pld/Makefile
config.status: creating doc/Makefile
config.status: creating config.h
config.status: executing depfiles commands
config.status: executing libtool commands
[root@localhost openocd-0.4.0]#
运行“make”



```
arci@localhost:/home/arci/openocd-0.4.0
文件(F) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)
gcc -std=gnu99 -DHAVE_CONFIG_H -I. -I.. -I../src -I../src -g -O2 -Wall -Wstrict-prototypes -Wformat-security -Wextra -Wno-unused-parameter -Wbad-function-cast -Wcast-align -Wredundant-decls -Werror -MT main.o -MD -MP -MF .deps/main.Tpo -c -o main.o main.c
mv -f .deps/main.Tpo .deps/main.Po
/bin/sh ../libtool --tag=CC --mode=link gcc -std=gnu99 -g -O2 -Wall -Wstrict-prototypes -Wformat-security -Wextra -Wno-unused-parameter -Wbad-function-cast -Wcast-align -Wredundant-decls -Werror -o openocd main.o libopenocd.1a -ldl -lftdi -lusb
libtool: link: gcc -std=gnu99 -g -O2 -Wall -Wstrict-prototypes -Wformat-security -Wextra -Wno-unused-parameter -Wbad-function-cast -Wcast-align -Wredundant-decls -Werror -o openocd main.o ../libs/libopenocd.a -ldl -lftdi -lusb
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src'
make[2]: Leaving directory `/home/arci/openocd-0.4.0/src'
Making all in doc
make[2]: Entering directory `/home/arci/openocd-0.4.0/doc'
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/home/arci/openocd-0.4.0/doc'
make[2]: Entering directory `/home/arci/openocd-0.4.0'
make[2]: Nothing to be done for `all-am'.
make[2]: Leaving directory `/home/arci/openocd-0.4.0'
make[1]: Leaving directory `/home/arci/openocd-0.4.0'
[root@localhost openocd-0.4.0]#
```

编译过程过长，最前面部分已经显示不下，因此只作一个截图

运行“make install”

```
[root@localhost openocd-0.4.0]# make install
Making install in src
make[1]: Entering directory `/home/arci/openocd-0.4.0/src'
make install-recursive
make[2]: Entering directory `/home/arci/openocd-0.4.0/src'
Making install in helper
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/helper'
make install-am
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/helper'
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/helper'
make[5]: Nothing to be done for `install-exec-am'.
make[5]: Nothing to be done for `install-data-am'.
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/helper'
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/helper'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/helper'
Making install in jtag
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/jtag'
make install-recursive
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/jtag'
Making install in drivers
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/jtag/drivers'
make[6]: Entering directory `/home/arci/openocd-0.4.0/src/jtag/drivers'
make[6]: Nothing to be done for `install-exec-am'.
make[6]: Nothing to be done for `install-data-am'.
make[6]: Leaving directory `/home/arci/openocd-0.4.0/src/jtag/drivers'
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/jtag/drivers'
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/jtag'
make[6]: Entering directory `/home/arci/openocd-0.4.0/src/jtag'
make[6]: Nothing to be done for `install-exec-am'.
make[6]: Nothing to be done for `install-data-am'.
make[6]: Leaving directory `/home/arci/openocd-0.4.0/src/jtag'
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/jtag'
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/jtag'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/jtag'
Making install in target
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/target'
make install-am
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/target'
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/target'
test -z "/usr/local/lib/openocd" || /bin/mkdir -p "/usr/local/lib/openocd"
/bin/sh /home/arci/openocd-0.4.0/install-sh -c -m 644 'ecos/at91eb40a.elf'
'/usr/local/lib/openocd/ecos/at91eb40a.elf'
make[5]: Nothing to be done for `install-data-am'.
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/target'
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/target'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/target'
Making install in flash
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/flash'
Making install in nor
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/flash/nor'
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/flash/nor'
make[5]: Nothing to be done for `install-exec-am'.
make[5]: Nothing to be done for `install-data-am'.
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/flash/nor'
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/flash/nor'
Making install in nand
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/flash/nand'
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/flash/nand'
```

```

make[5]: Nothing to be done for `install-exec-am'.
make[5]: Nothing to be done for `install-data-am'.
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/flash/nand'
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/flash/nand'
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/flash'
make[5]: Entering directory `/home/arci/openocd-0.4.0/src/flash'
make[5]: Nothing to be done for `install-exec-am'.
make[5]: Nothing to be done for `install-data-am'.
make[5]: Leaving directory `/home/arci/openocd-0.4.0/src/flash'
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/flash'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/flash'
Making install in svf
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/svf'
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/svf'
make[4]: Nothing to be done for `install-exec-am'.
make[4]: Nothing to be done for `install-data-am'.
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/svf'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/svf'
Making install in xsvf
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/xsvf'
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/xsvf'
make[4]: Nothing to be done for `install-exec-am'.
make[4]: Nothing to be done for `install-data-am'.
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/xsvf'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/xsvf'
Making install in pld
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/pld'
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/pld'
make[4]: Nothing to be done for `install-exec-am'.
make[4]: Nothing to be done for `install-data-am'.
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/pld'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/pld'
Making install in server
make[3]: Entering directory `/home/arci/openocd-0.4.0/src/server'
make[4]: Entering directory `/home/arci/openocd-0.4.0/src/server'
make[4]: Nothing to be done for `install-exec-am'.
test -z "/usr/local/share/openocd" || /bin/mkdir -p "/usr/local/share/openocd"
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src/server'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src/server'
make[3]: Entering directory `/home/arci/openocd-0.4.0/src'
make[4]: Entering directory `/home/arci/openocd-0.4.0/src'
test -z "/usr/local/lib" || /bin/mkdir -p "/usr/local/lib"
/bin/sh ../libtool --mode=install /usr/bin/install -c 'libopenocd.la'
'/usr/local/lib/libopenocd.la'
libtool: install: /usr/bin/install -c .libs/libopenocd.lai /usr/local/lib/libopenocd.la
libtool: install: /usr/bin/install -c .libs/libopenocd.a /usr/local/lib/libopenocd.a
libtool: install: chmod 644 /usr/local/lib/libopenocd.a
libtool: install: ranlib /usr/local/lib/libopenocd.a
libtool: finish: PATH="/usr/kerberos/sbin:/home/arci/CodeSourcery/Sourcery_G+
+_Lite/bin:/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/arci/bin:/sbin"
ldconfig -n /usr/local/lib

```

Libraries have been installed in:
 /usr/local/lib

If you ever happen to want to link against installed libraries in a given directory, LIBDIR, you must either use libtool, and specify the full pathname of the library, or use the '-LLIBDIR' flag during linking and do at least one of the following:

- add LIBDIR to the `LD_LIBRARY_PATH` environment variable during execution
- add LIBDIR to the `LD_RUN_PATH` environment variable during linking
- use the `-Wl,-rpath -Wl,LIBDIR` linker flag
- have your system administrator add LIBDIR to `/etc/ld.so.conf`

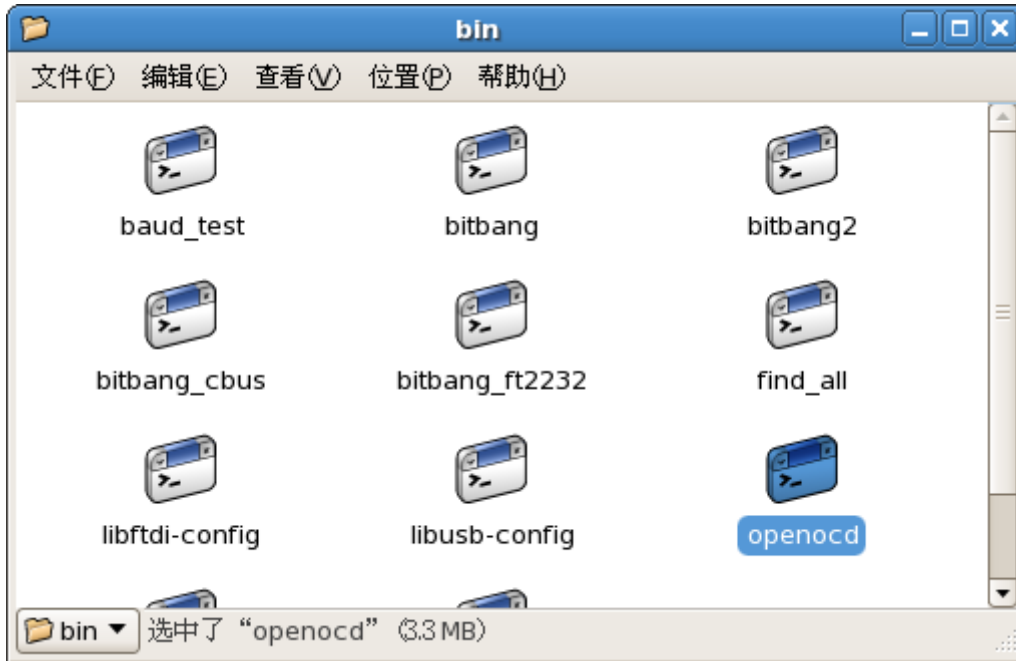
See any operating system documentation about shared libraries for more information, such as the ld(1) and ld.so(8) manual pages.

```

-----
test -z "/usr/local/bin" || /bin/mkdir -p "/usr/local/bin"
/bin/sh ../libtool --mode=install /usr/bin/install -c 'openocd' '/usr/local/bin/openocd'
libtool: install: /usr/bin/install -c openocd /usr/local/bin/openocd
make[4]: Nothing to be done for `install-data-am'.
make[4]: Leaving directory `/home/arci/openocd-0.4.0/src'
make[3]: Leaving directory `/home/arci/openocd-0.4.0/src'
make[2]: Leaving directory `/home/arci/openocd-0.4.0/src'
make[1]: Leaving directory `/home/arci/openocd-0.4.0/src'
Making install in doc
make[1]: Entering directory `/home/arci/openocd-0.4.0/doc'
make[2]: Entering directory `/home/arci/openocd-0.4.0/doc'
make[2]: Nothing to be done for `install-exec-am'.
test -z "/usr/local/share/info" || /bin/mkdir -p "/usr/local/share/info"
/usr/bin/install -c -m 644 './openocd.info' '/usr/local/share/info/openocd.info'
/usr/bin/install -c -m 644 './openocd.info-1' '/usr/local/share/info/openocd.info-1'
/usr/bin/install -c -m 644 './openocd.info-2' '/usr/local/share/info/openocd.info-2'
test -z "/usr/local/share/man/man1" || /bin/mkdir -p "/usr/local/share/man/man1"
/usr/bin/install -c -m 644 './openocd.1' '/usr/local/share/man/man1/openocd.1'
make[2]: Leaving directory `/home/arci/openocd-0.4.0/doc'
make[1]: Leaving directory `/home/arci/openocd-0.4.0/doc'
make[1]: Entering directory `/home/arci/openocd-0.4.0'
make[2]: Entering directory `/home/arci/openocd-0.4.0'
make[2]: Nothing to be done for `install-exec-am'.
test -z "/usr/local/share/openocd" || /bin/mkdir -p "/usr/local/share/openocd"
/bin/sh /home/arci/openocd-0.4.0/install-sh -c -m 644 'contrib/libdcc/dcc_stdio.c'
'/usr/local/share/openocd/contrib/libdcc/dcc_stdio.c'
/bin/sh /home/arci/openocd-0.4.0/install-sh -c -m 644 'contrib/libdcc/dcc_stdio.h'
'/usr/local/share/openocd/contrib/libdcc/dcc_stdio.h'
/bin/sh /home/arci/openocd-0.4.0/install-sh -c -m 644 'contrib/libdcc/example.c'
'/usr/local/share/openocd/contrib/libdcc/example.c'
/bin/sh /home/arci/openocd-0.4.0/install-sh -c -m 644 'contrib/libdcc/README'
'/usr/local/share/openocd/contrib/libdcc/README'
/bin/sh /home/arci/openocd-0.4.0/install-sh -c -m 644 'contrib/openocd.udev'
'/usr/local/share/openocd/contrib/openocd.udev'
make install-data-hook
make[3]: Entering directory `/home/arci/openocd-0.4.0'
for i in $(find ./tcl -name '*.cfg' -o -name '*.tcl' | sed -e 's,^./tcl,,'); do \
    j="/usr/local/share/openocd/scripts/$i" && \
    mkdir -p "$(dirname $j)" && \
    /usr/bin/install -c -m 644 ./tcl/$i $j; \
done
make[3]: Leaving directory `/home/arci/openocd-0.4.0'
make[2]: Leaving directory `/home/arci/openocd-0.4.0'
make[1]: Leaving directory `/home/arci/openocd-0.4.0'
[root@localhost openocd-0.4.0]#

```


OpenOCD 安装到了“/usr/local/bin/”目录中



运行“openocd --version”命令进行测试

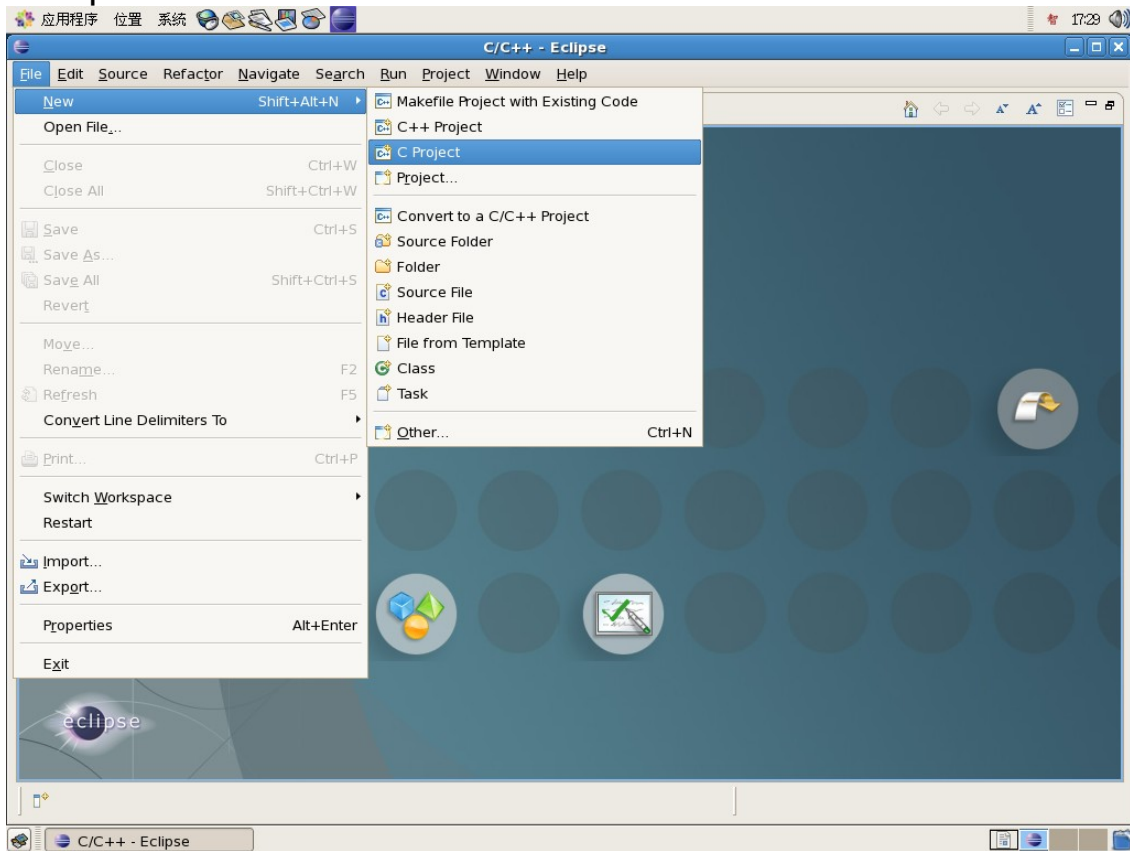


OpenOCD 安装完成

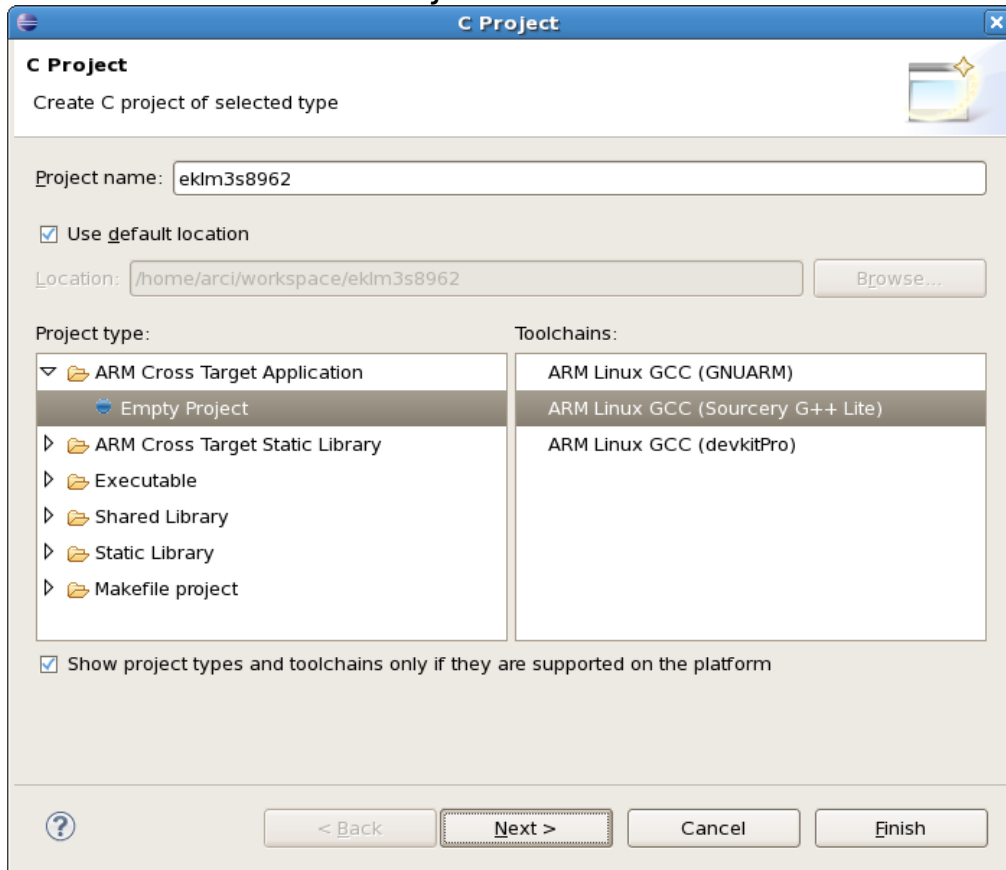
5、应用举例

5.1、新建工程

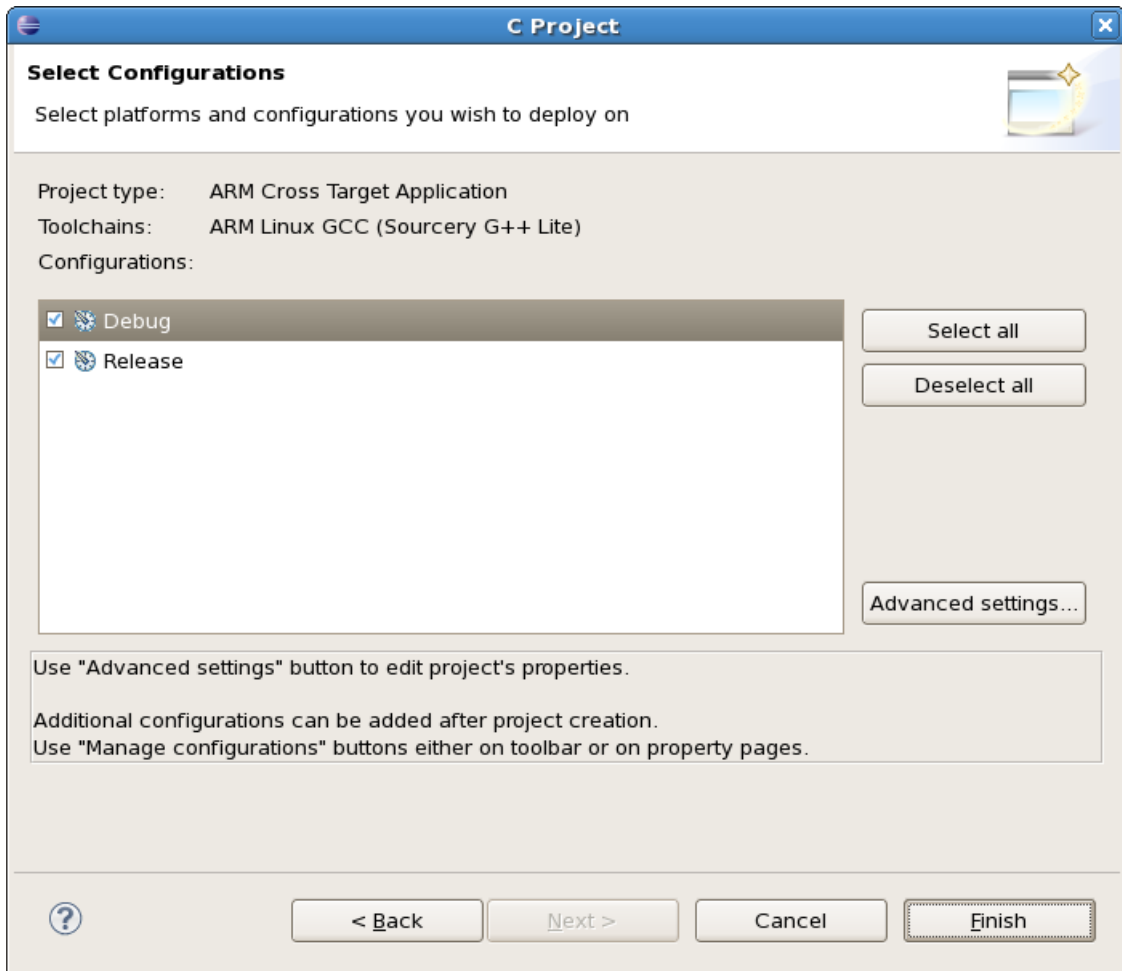
运行“eclipse”



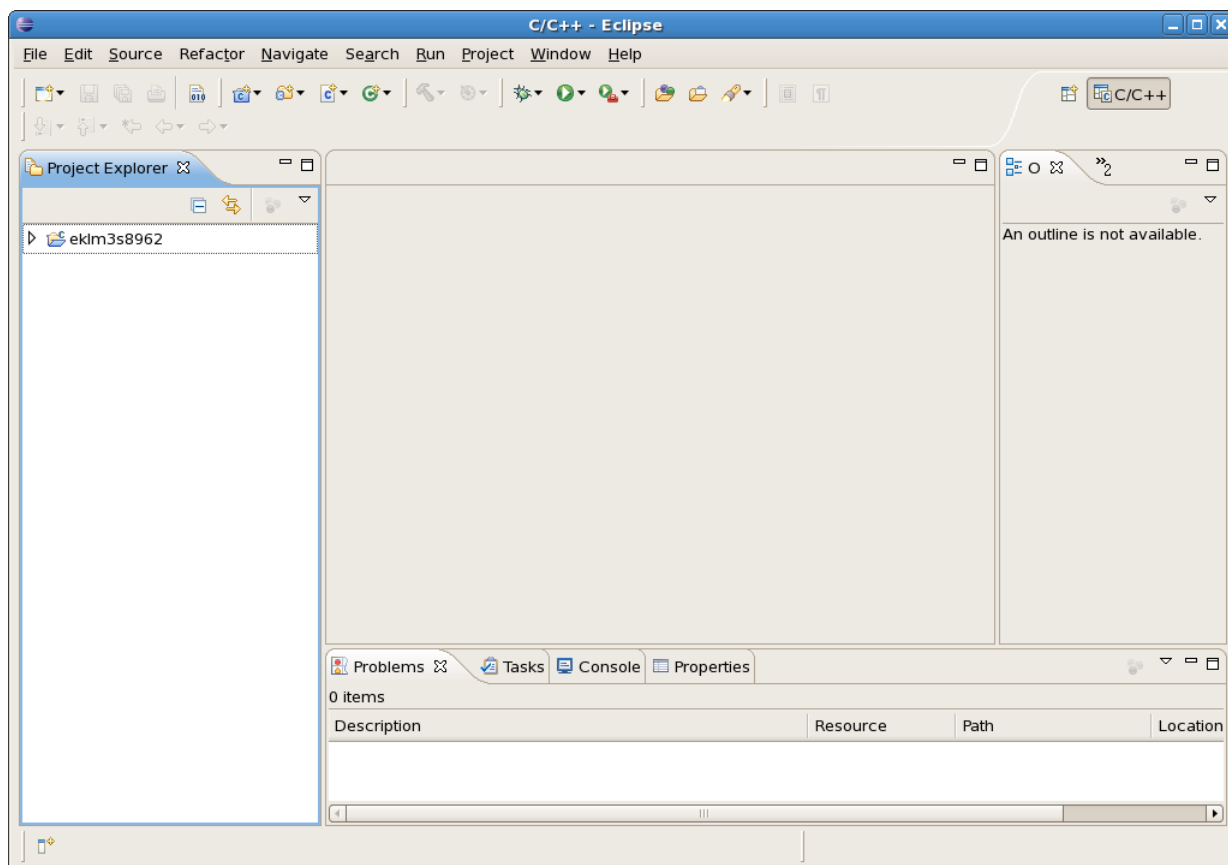
点击“File”——“New”——“C Project”



点击“Next”



点击“Finish”
点击关闭“Welcome”页面

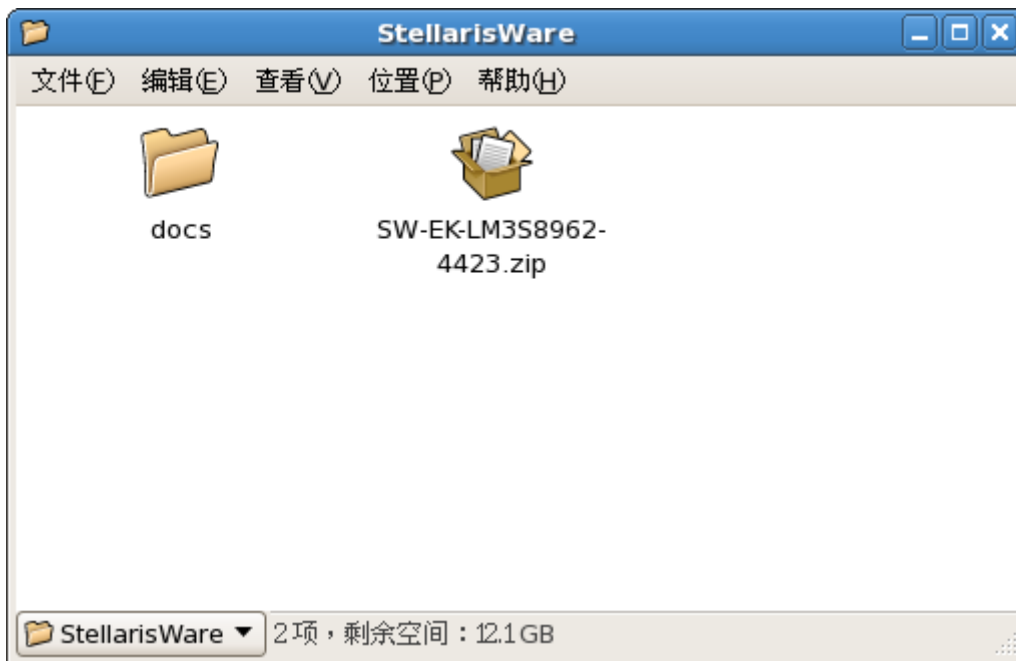


5.2、添加代码

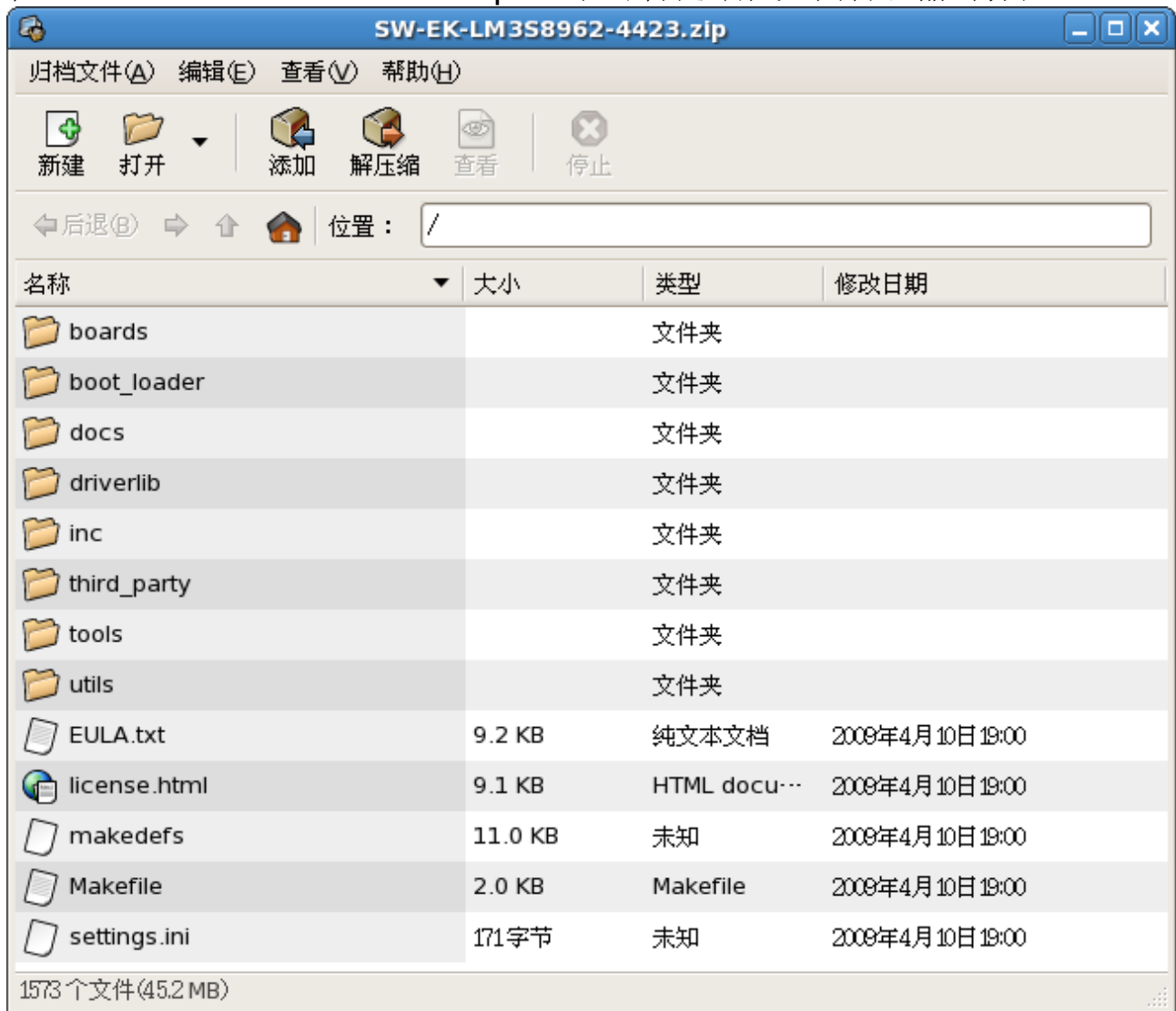
复制 Stellaris® LM3S8962 Ethernet + CAN 评估套件提供的光盘中的“Tools/StellarisWare/”目录



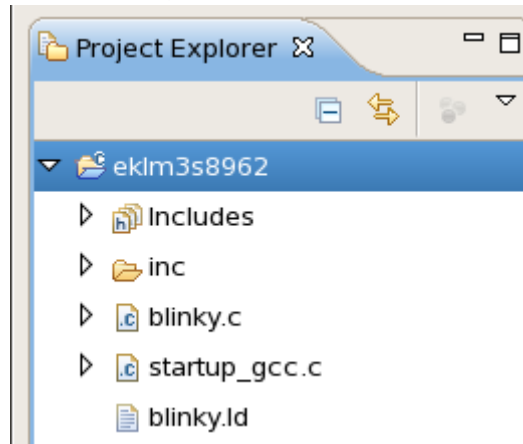
将“SW-EK-LM3S8962-4423.exe”重命名为“SW-EK-LM3S8962-4423.zip”



在“SW-EK-LM3S8962-4423.zip”上单击右键“用“归档管理器”打开”

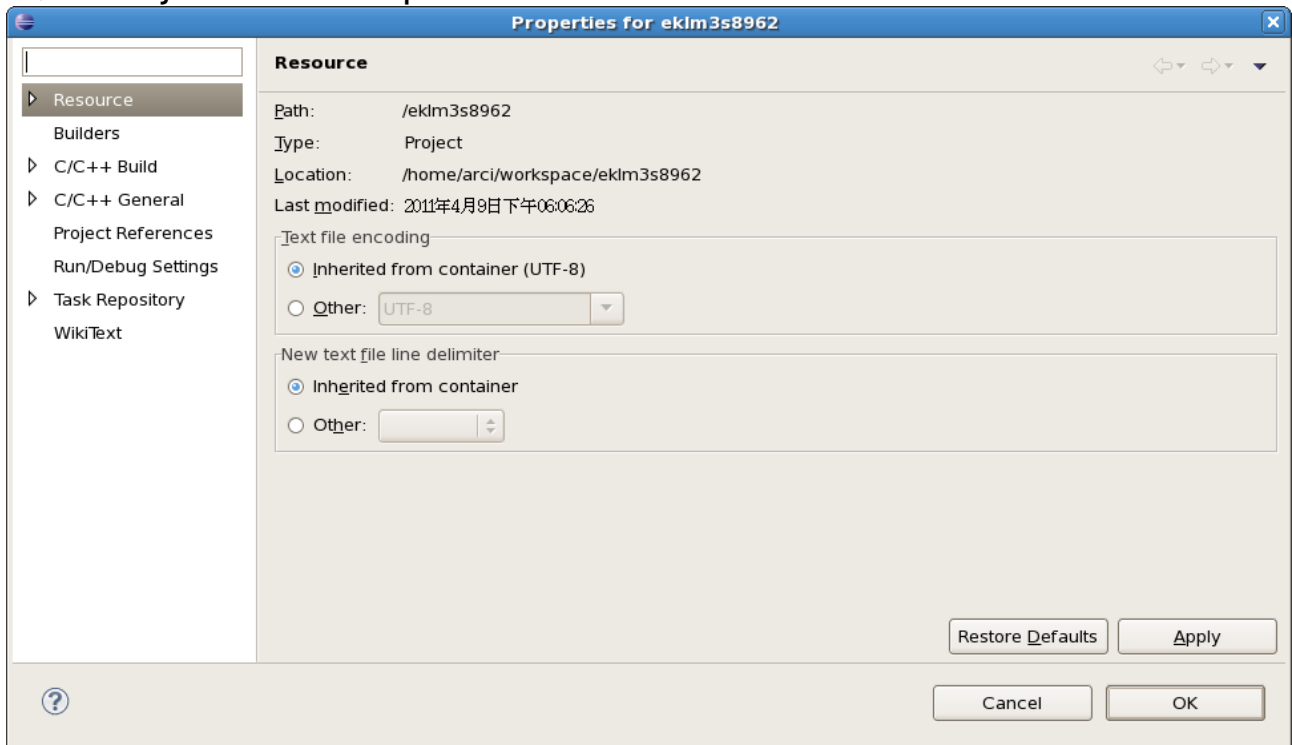


解压文件，并复制“boards/ek-lm3s8962/blinkyl”目录中的“blinkyl.c”，“blinkyl.ld”和“startup_gcc.c”文件，“inc/”目录到“workspace/eklm3s8962/”中，在“Project Explorer”——“eklm3s8962”上单击右键，点击菜单中的“Refresh”

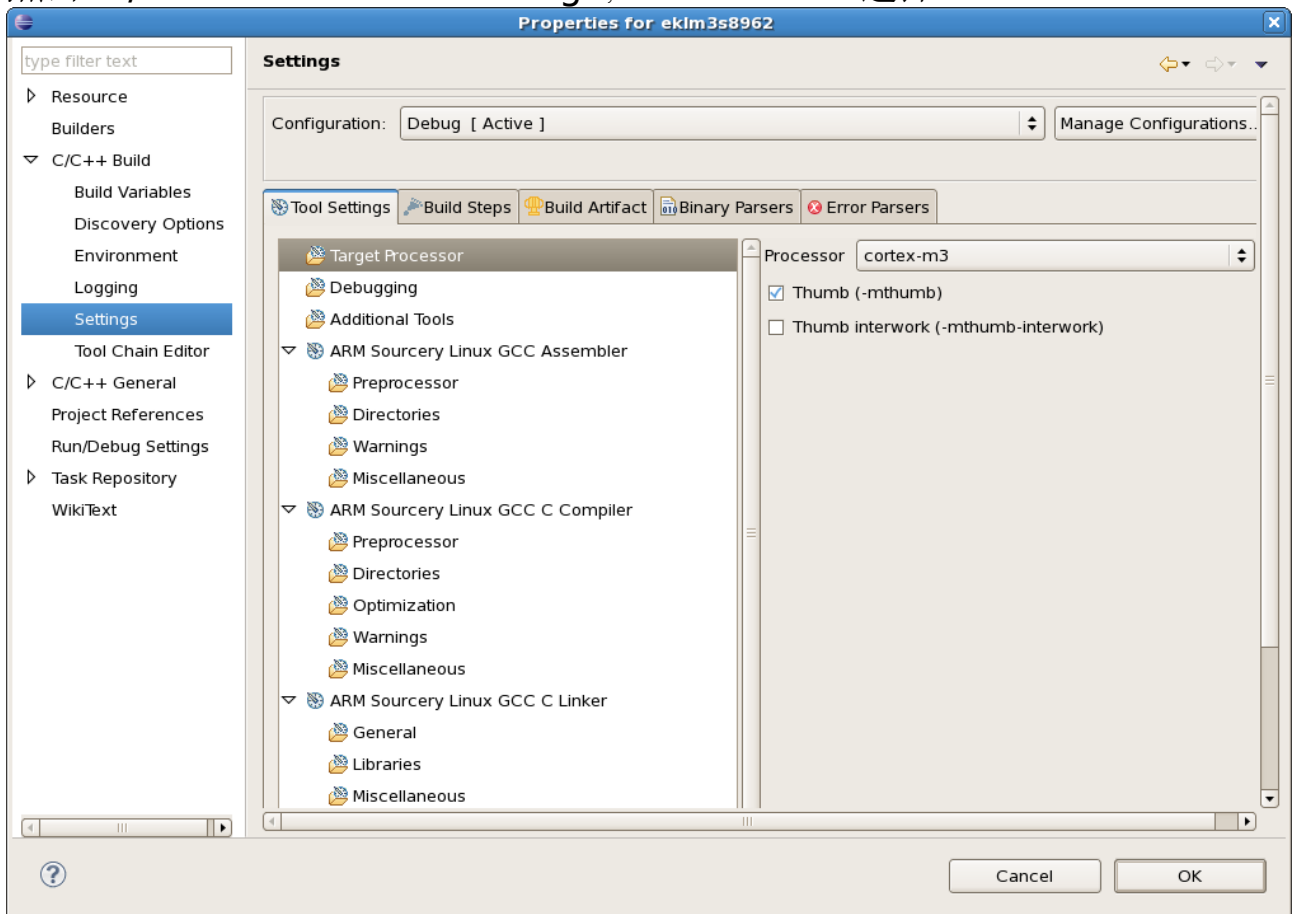


5.3、设置工程属性

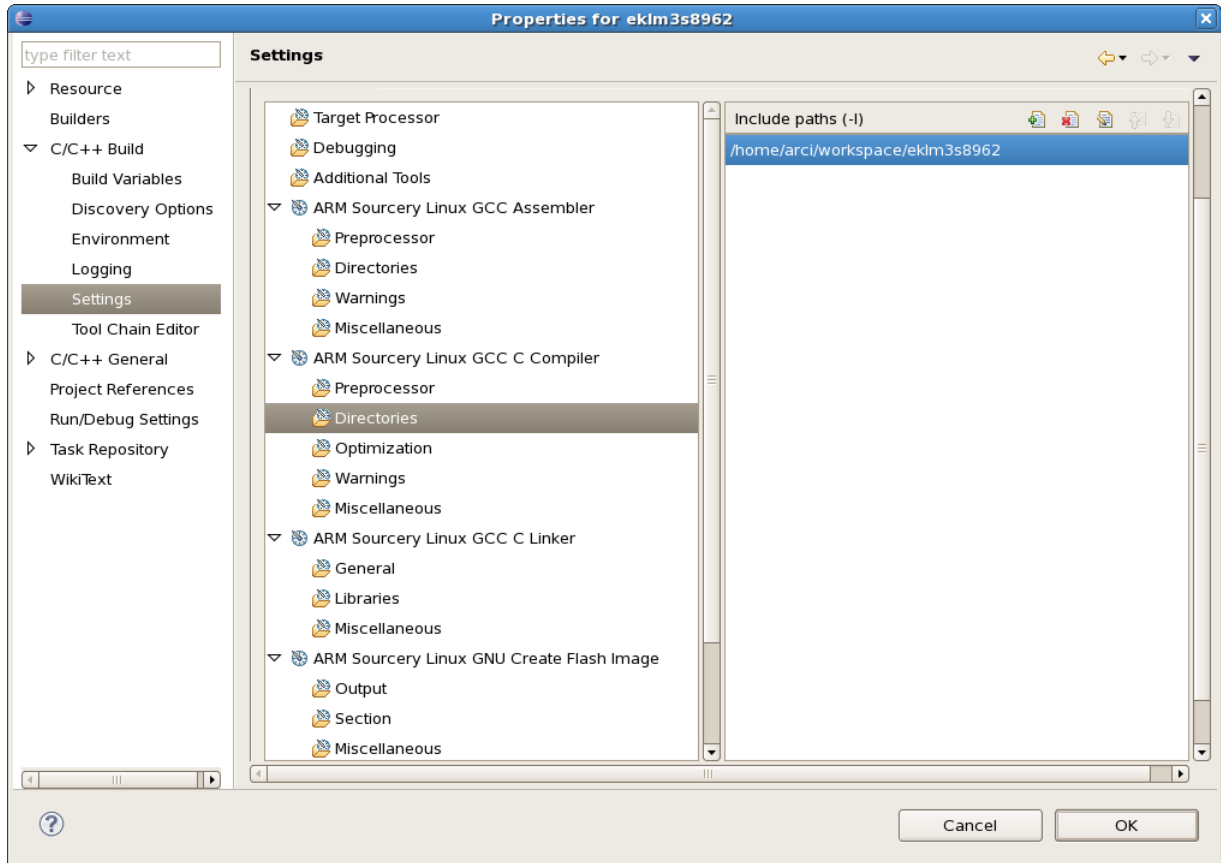
点击“Project”——“Properties”



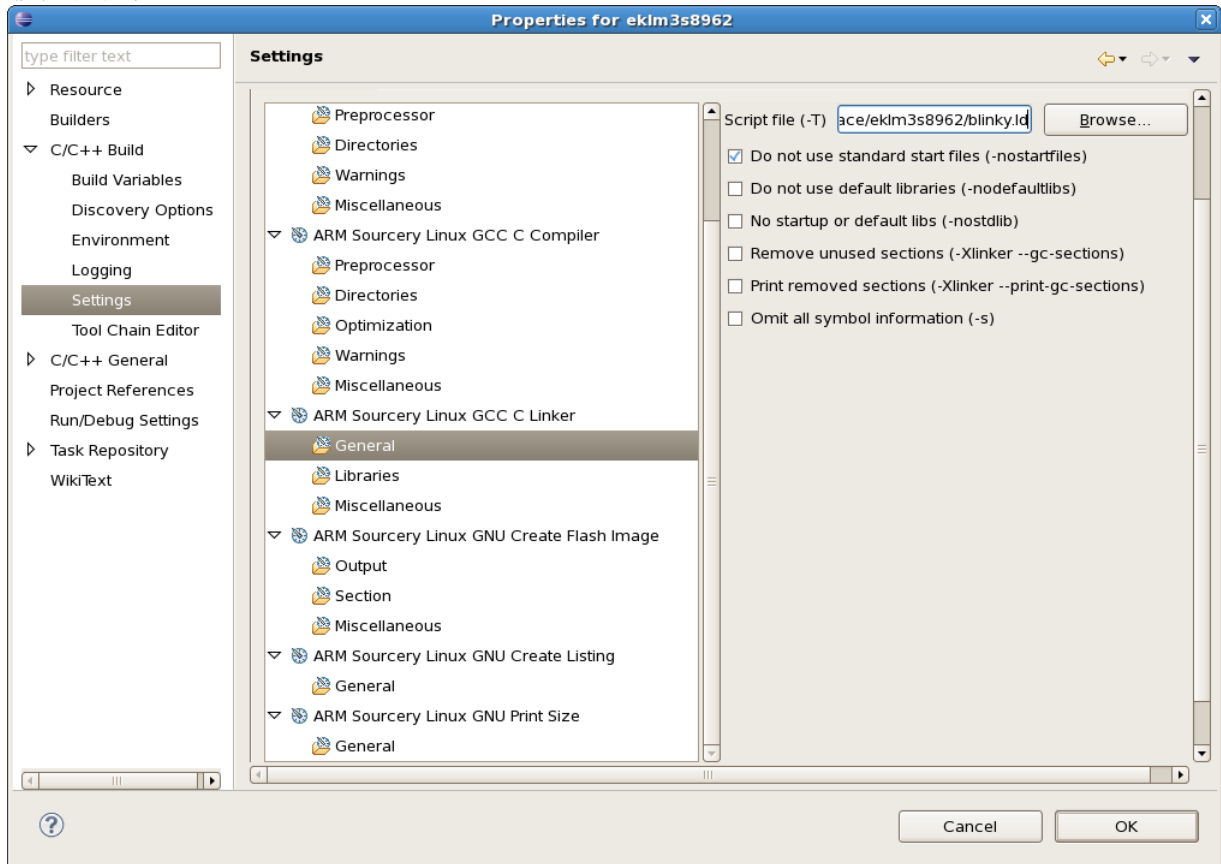
点击“C/C++ Build”——“Setting”，“Processor”选择“cortex-m3”



包含目录设置



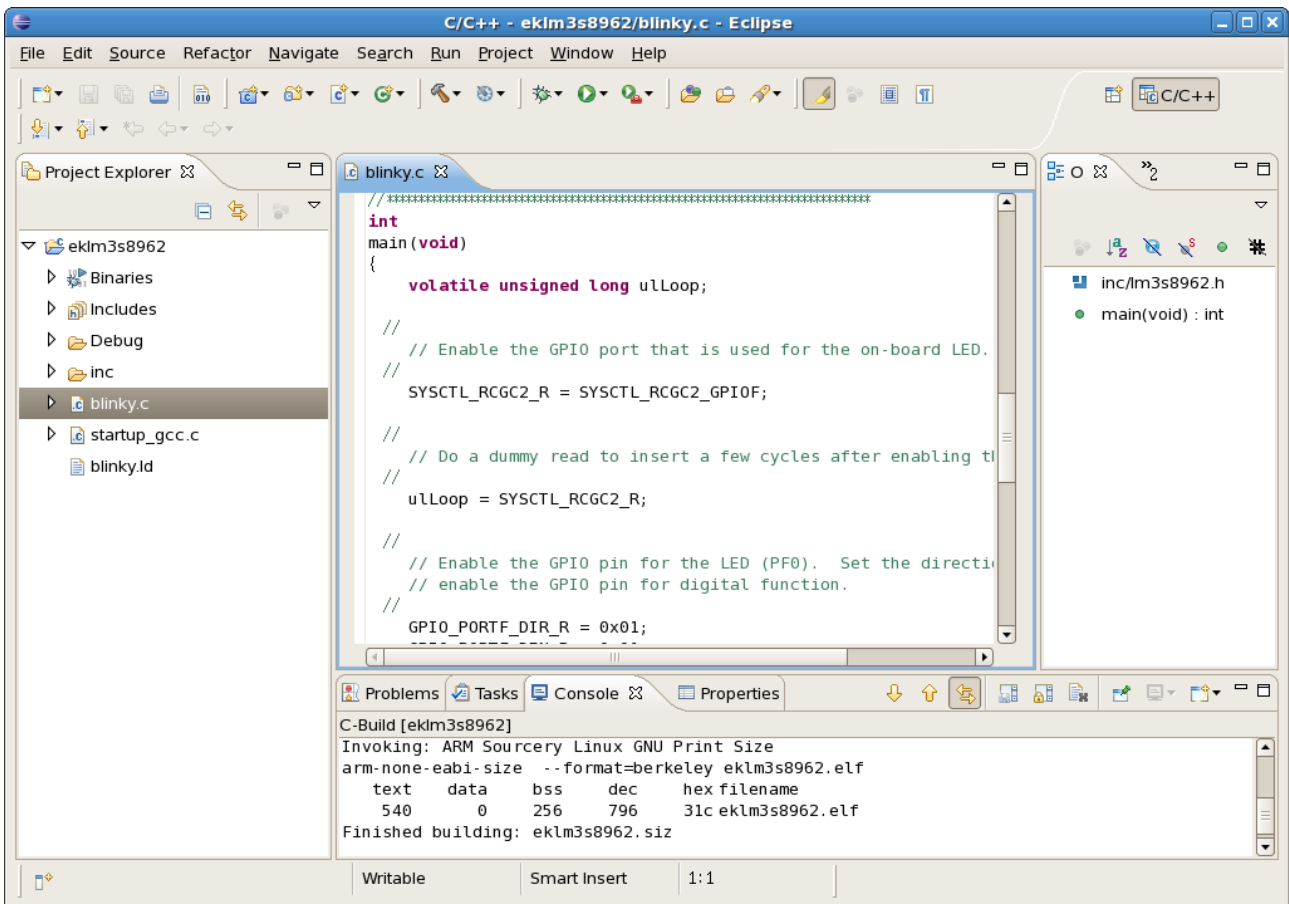
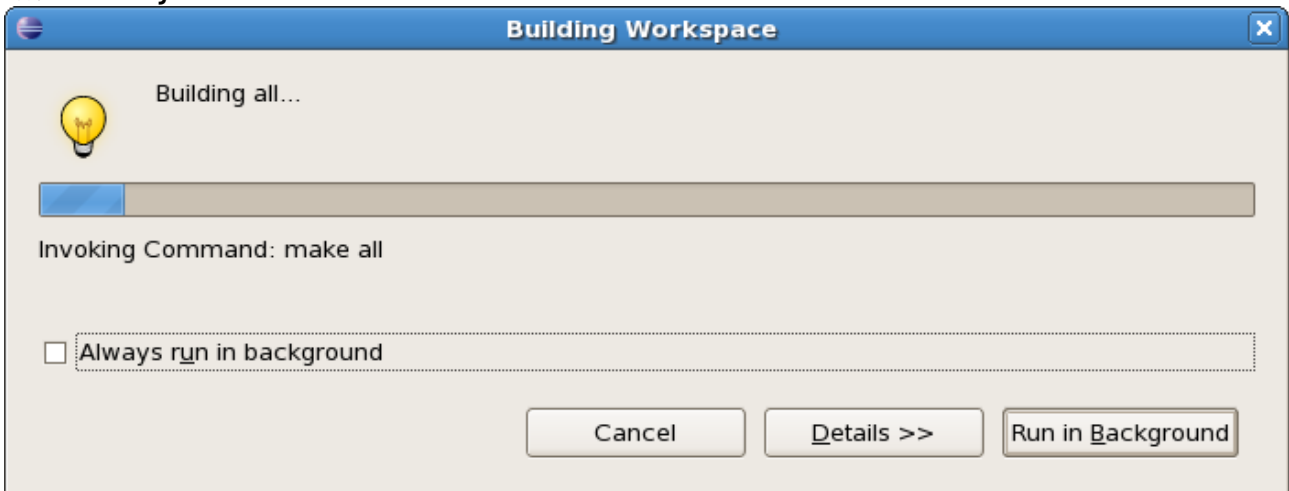
连接脚本设置



其他默认，点击“OK”

5.4、编译工程

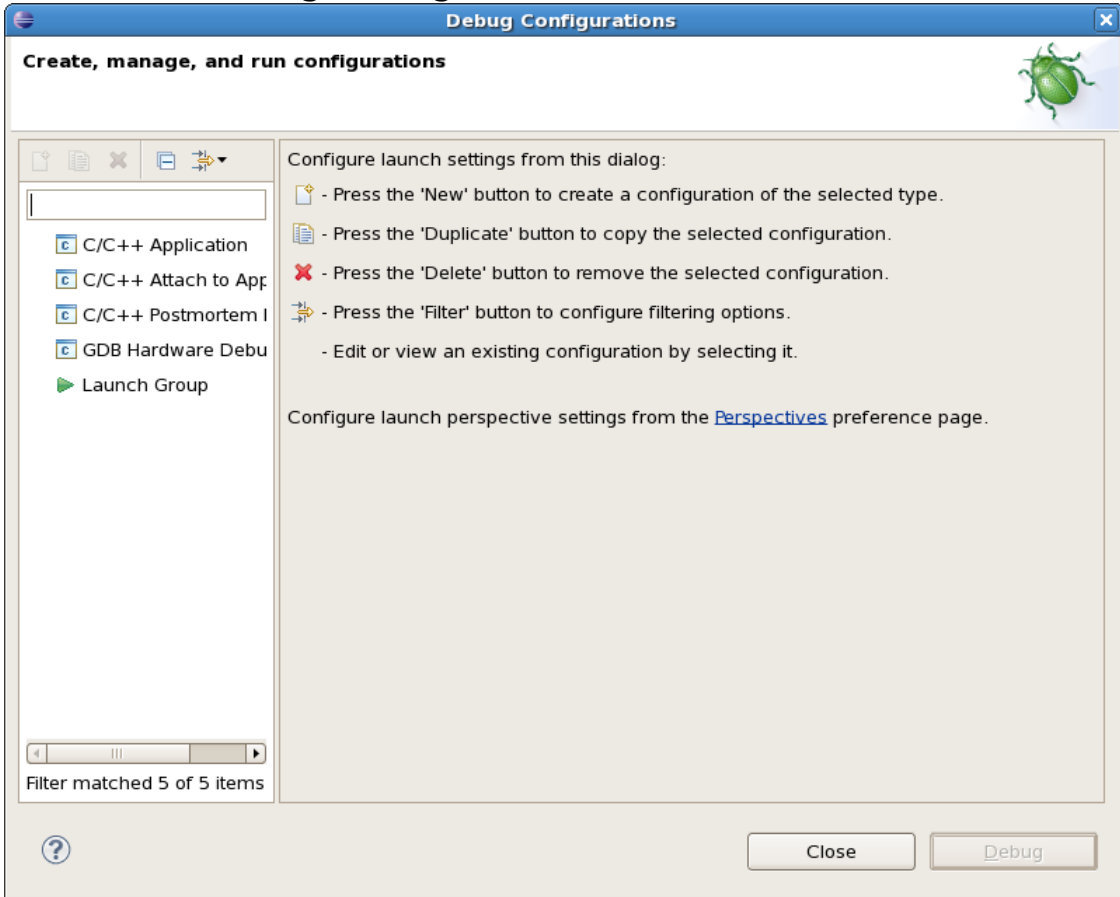
点击“Project”——“Build All”



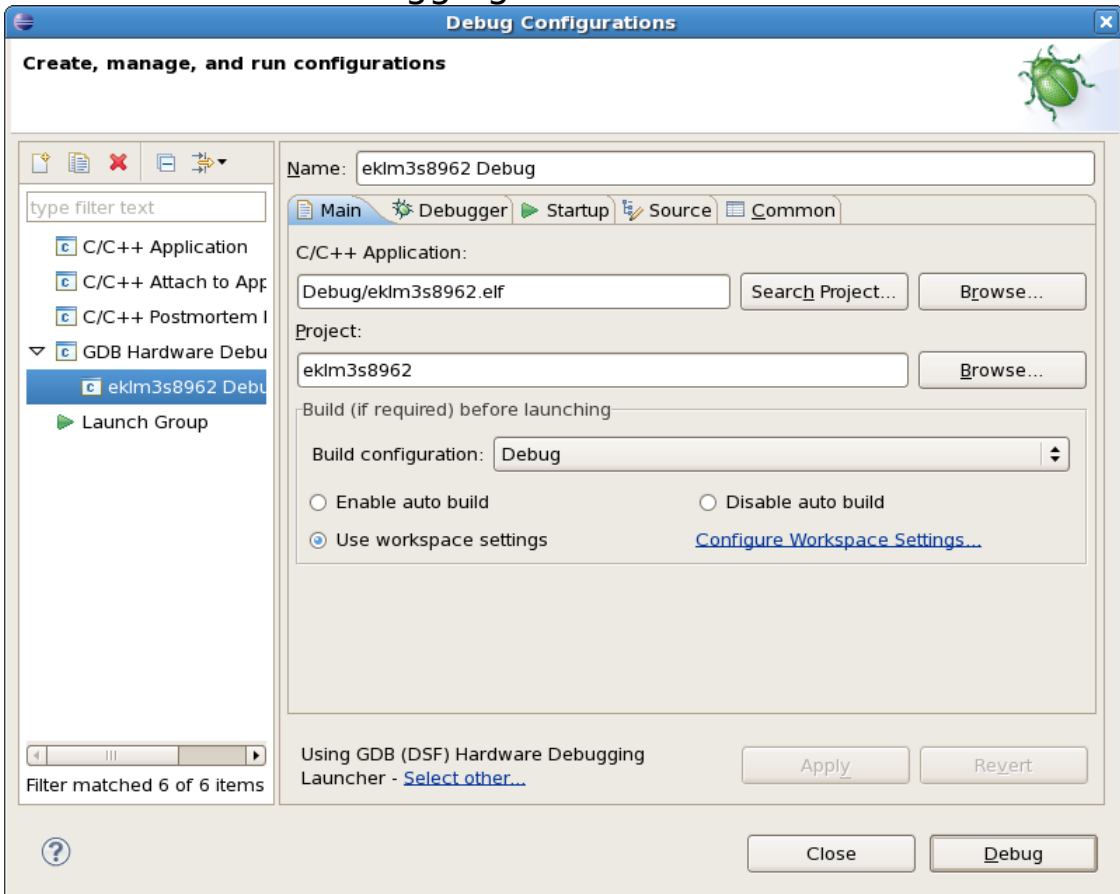
编译成功

5.5、调试配置

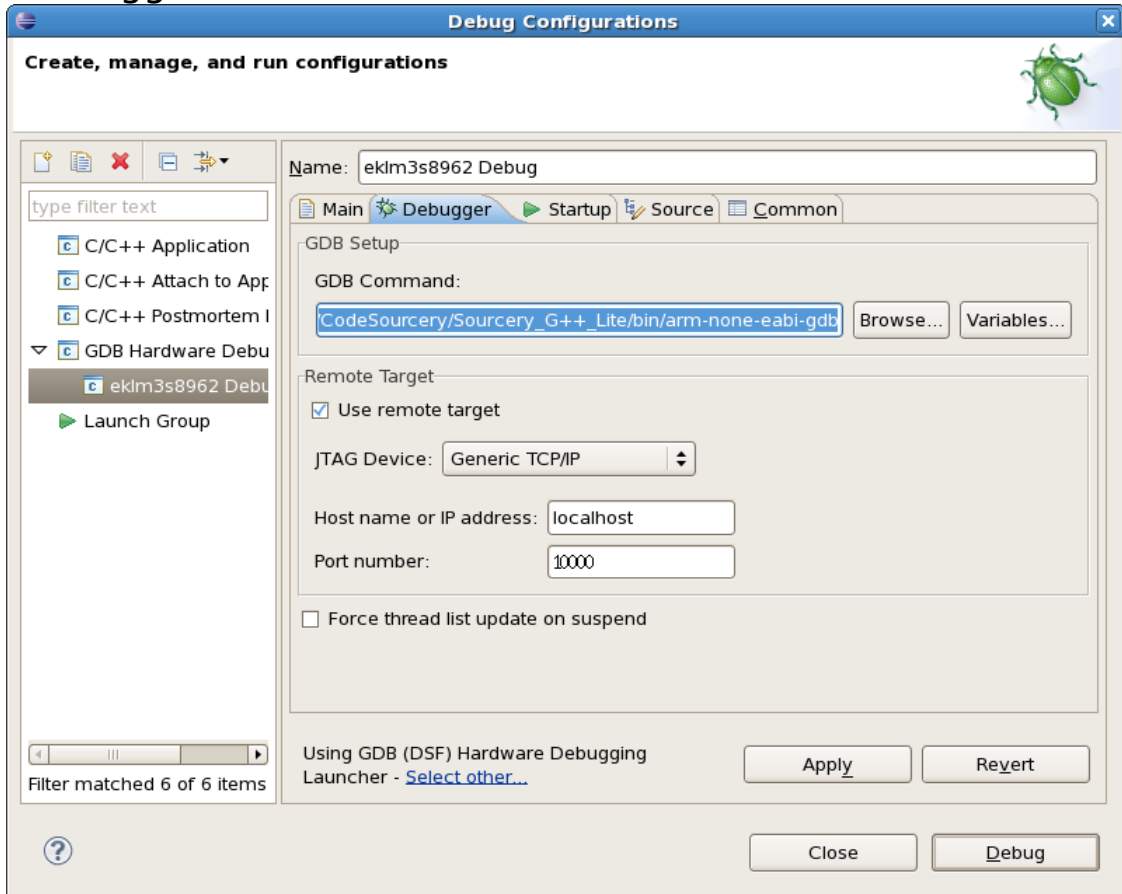
点击“Run”——“Debug Configurations”



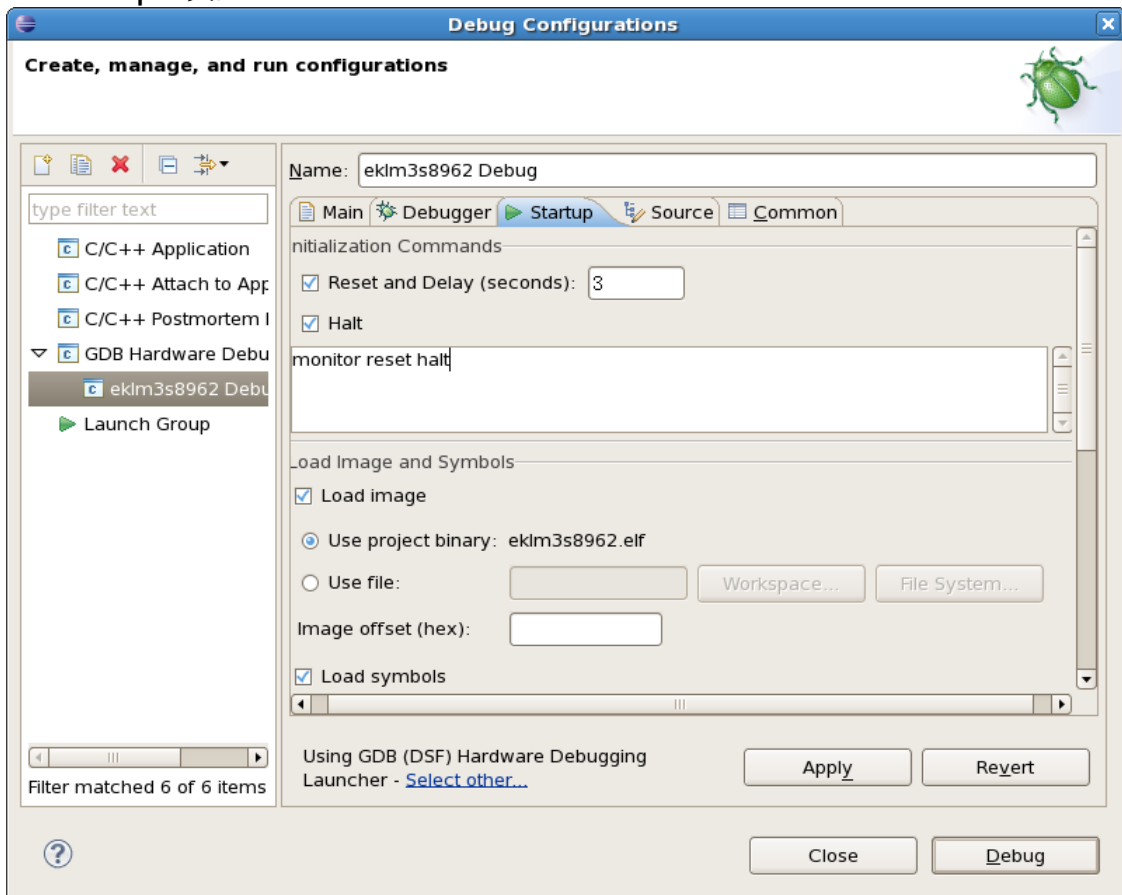
双击“GDB Hardware Debugging”



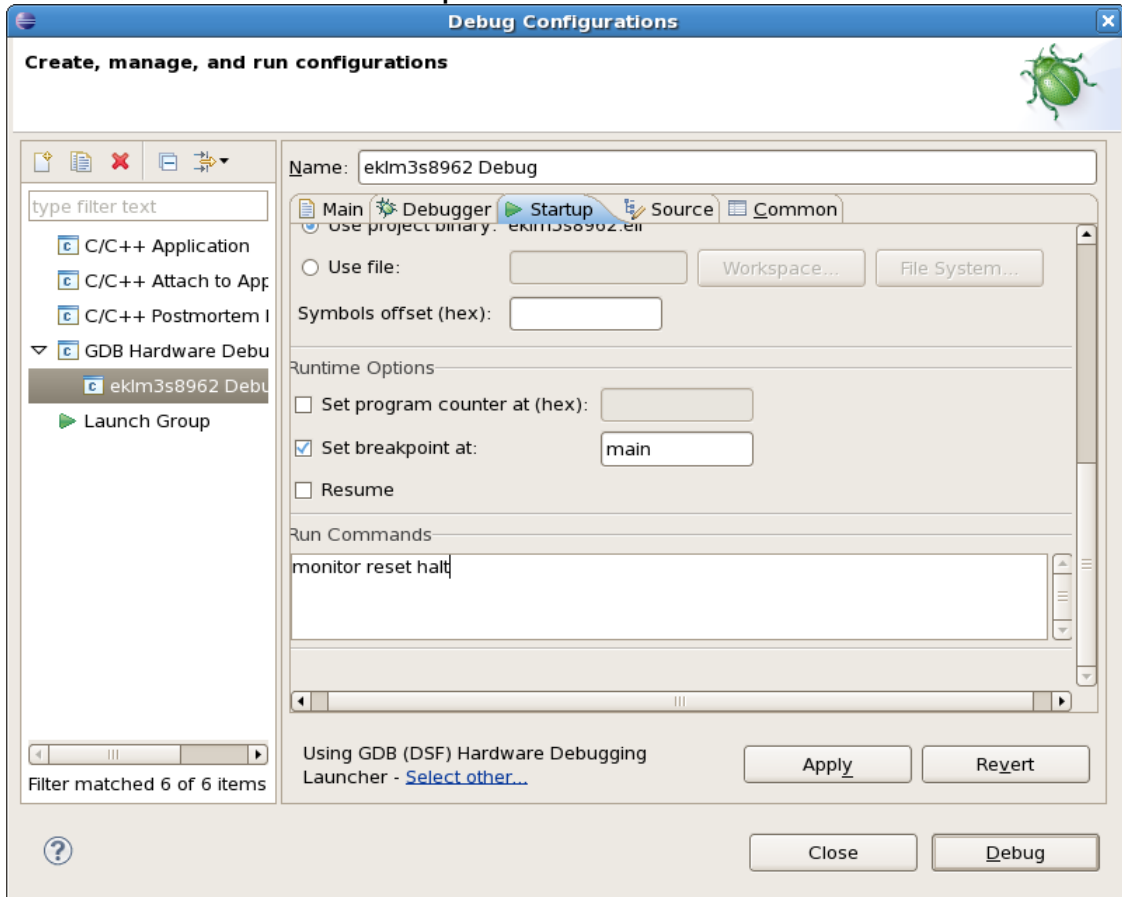
点击“Debugger”，设置“GDB Command”



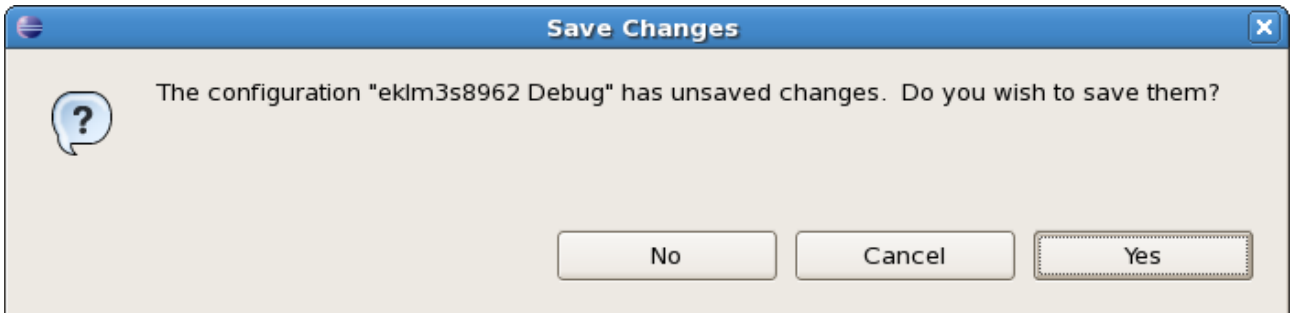
点击“Startup”设置“Initialization Commands”



拉动滚动条，设置“Set break point at”和“Run Commands”



点击“Close”



点击“Yes”

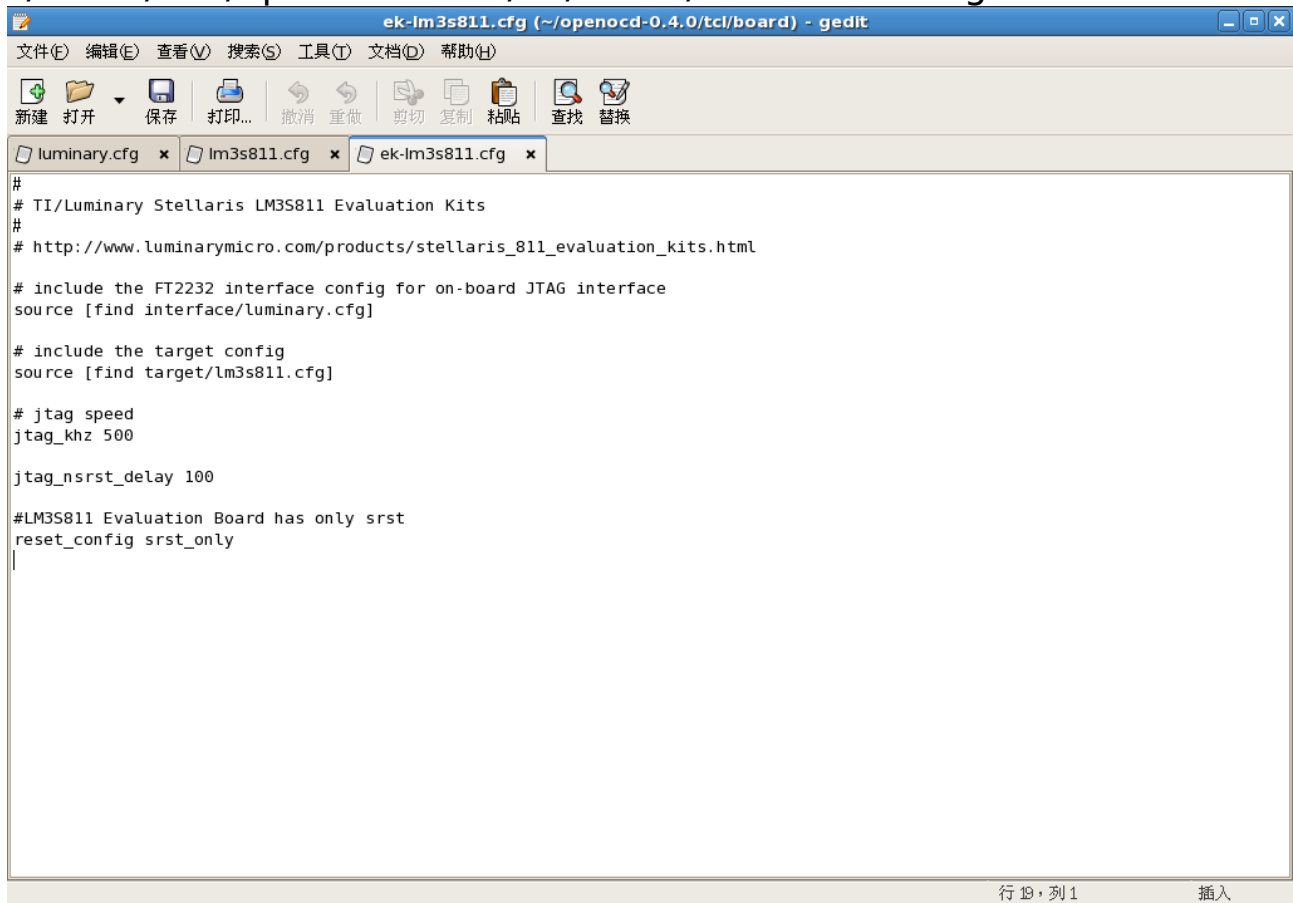
5.6、编写 OpenOCD 配置文件

参考：

“/home/arci/openocd-0.4.0/tcl/interface/luminary.cfg”

“/home/arci/openocd-0.4.0/tcl/target/lm3s811.cfg”

“/home/arci/openocd-0.4.0/tcl/board/ek-lm3s811.cfg”



The screenshot shows a gedit editor window titled "ek-lm3s811.cfg (~/.openocd-0.4.0/tcl/board) - gedit". The window contains the following configuration text:

```
#
# TI/Luminary Stellaris LM3S811 Evaluation Kits
#
# http://www.luminarymicro.com/products/stellaris_811_evaluation_kits.html

# include the FT2232 interface config for on-board JTAG interface
source [find interface/luminary.cfg]

# include the target config
source [find target/lm3s811.cfg]

# jtag speed
jtag_khz 500

jtag_nsrst_delay 100

#LM3S811 Evaluation Board has only srst
reset_config srst_only
|
```

The status bar at the bottom right of the window indicates "行 19, 列 1" and "插入".

新建 OpenOCD 配置文件“ek-lm3s8962.cfg”，内容如下：

```
# the FT2232 interface config for on-board JTAG interface
interface ft2232
ft2232_device_desc "Stellaris Evaluation Board"
ft2232_layout luminary_icdi
# 连接开发板后可以从“系统”-“管理”-“硬件”中查看
ft2232_vid_pid 0x0403 0xbcd8

# the target config
# Script for TI/Luminary Stellaris LM3S8962

if { [info exists CHIPNAME] } {
    set _CHIPNAME $CHIPNAME
} else {
    set _CHIPNAME lm3s8962
}

if { [info exists CPUTAPID ] } {
    set _CPUTAPID $CPUTAPID
} else {
    set _CPUTAPID 0x3ba00477
}

#jtag scan chain
jtag newtap $_CHIPNAME cpu -irlen 4 -ircapture 1 -irmask 0xf -expected-id $_CPUTAPID

# the luminary variant causes a software reset rather than asserting SRST
# this stops the debug registers from being cleared
# this will be fixed in later revisions of silicon
set _TARGETNAME $_CHIPNAME.cpu
target create $_TARGETNAME cortex_m3 -chain-position $_CHIPNAME.cpu -variant lm3s

# 8k working area at base of ram, not backed up
$_TARGETNAME configure -work-area-phys 0x20000000 -work-area-size 0x2000

#flash configuration
set _FLASHNAME $_CHIPNAME.flash
flash bank $_FLASHNAME stellaris 0 0 0 0 $_TARGETNAME

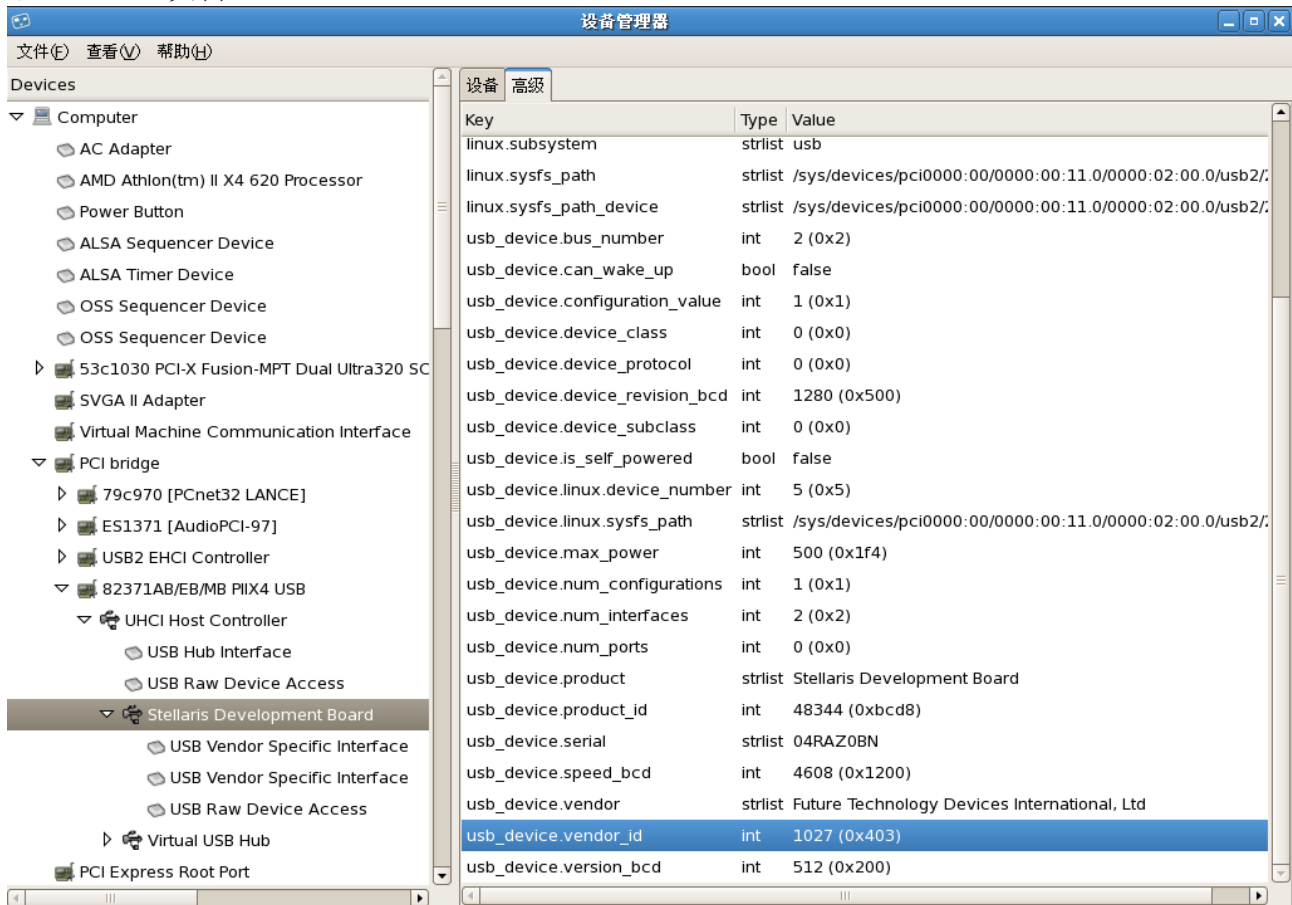
# jtag speed
jtag_khz 500

jtag_nsrst_delay 100

# LM3S8962 Evaluation Board has only srst
reset_config srst_only

# Daemon Configuration
# TCP/IP Ports
telnet_port 4444
# gdb port 根据“GDB Hardware Debugging”中的设置进行配置
gdb_port 10000
```

“ft2232_vid_pid 0x0403 0xbcd8”中 VID, PID 值查看
连接 Stellaris® LM3S8962 Ethernet+CAN 评估套件, 点击“系统”——“管
理”——“硬件”



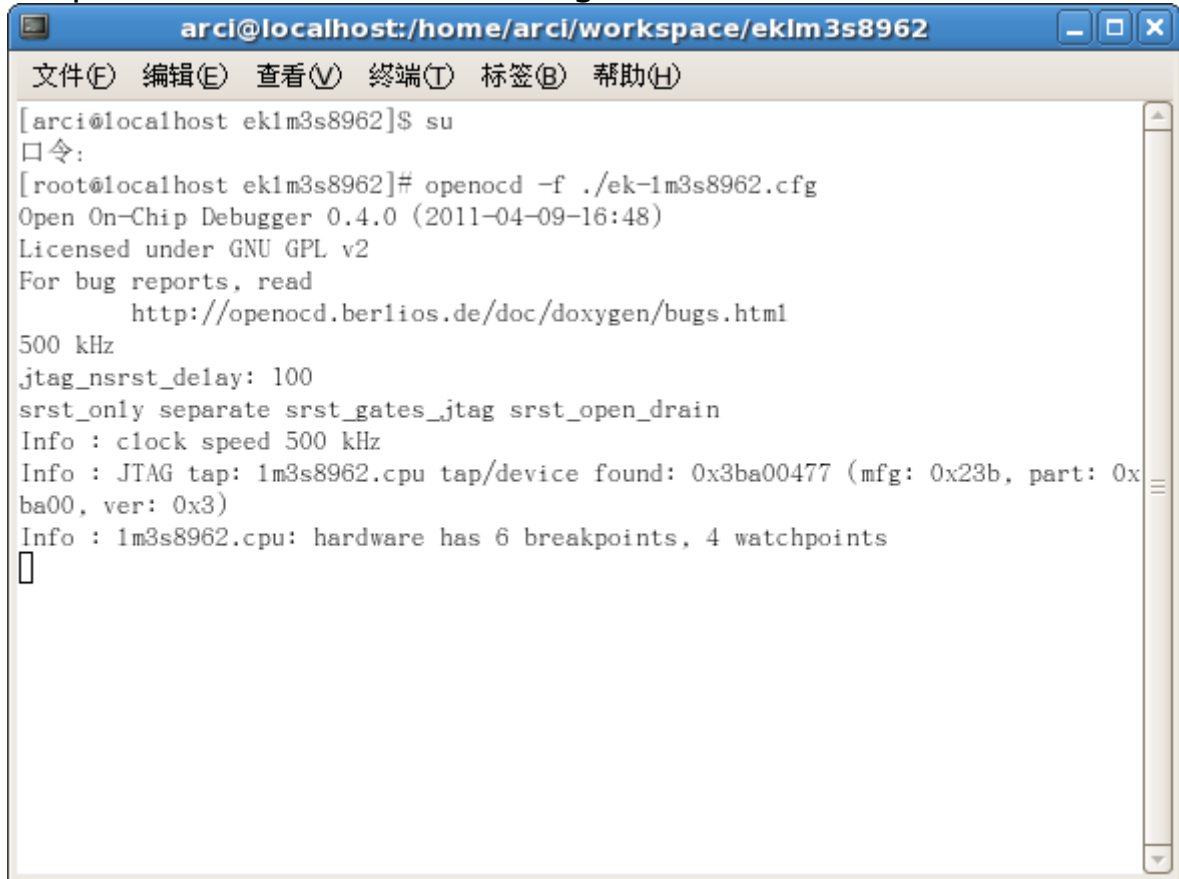
在此可以看到

usb_device.vendor_id = 0x0403

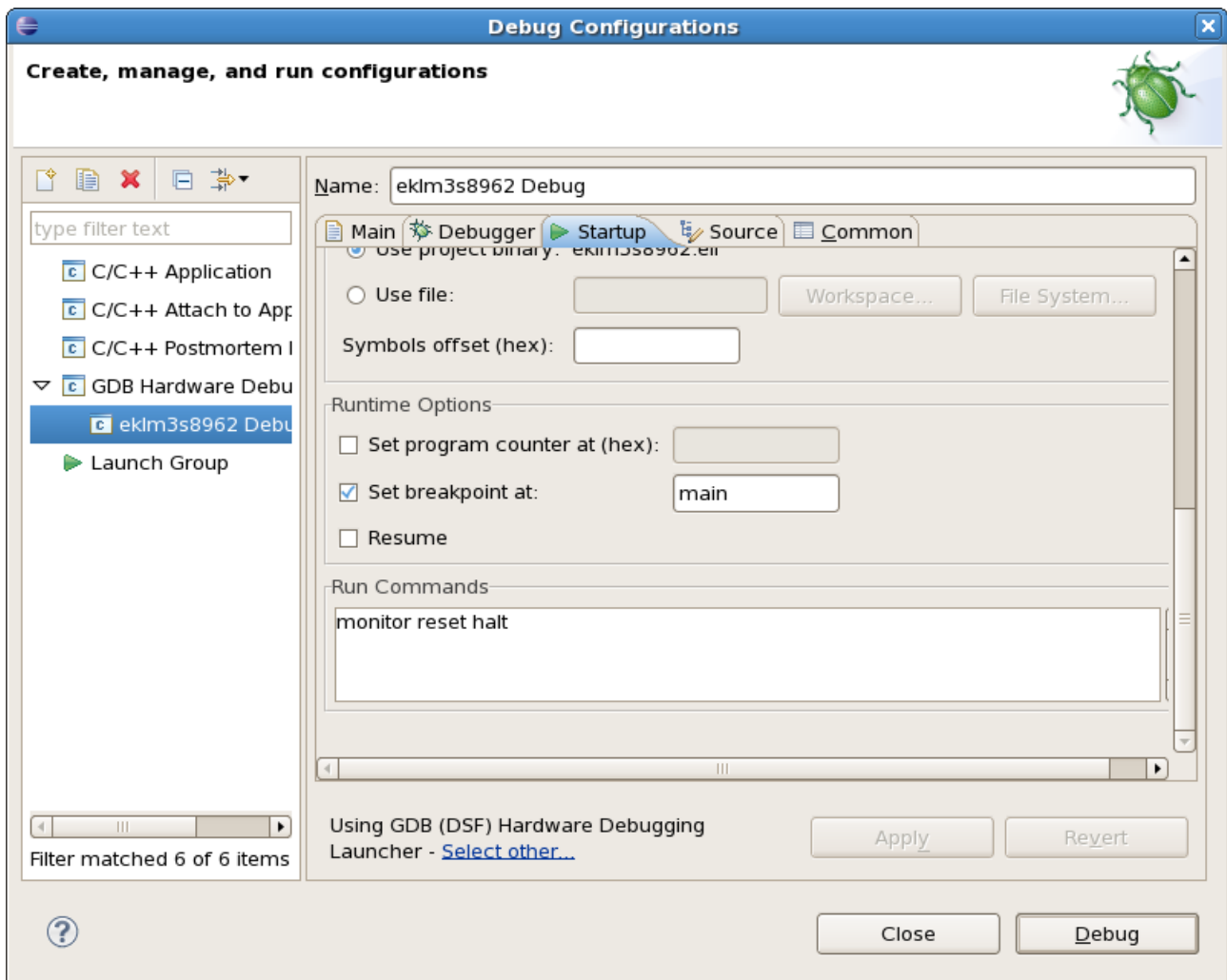
usb_device.product_id = 0xbcd8

5.7、系统调试

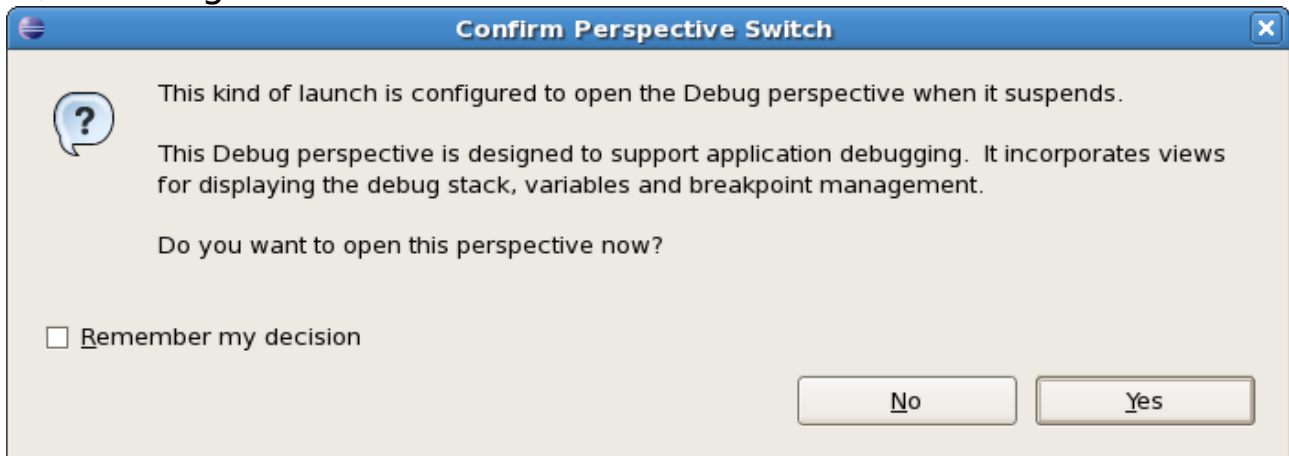
把“ek-lm3s8962.cfg”放在“workspace/eklm3s8962/”目录中，连接 Stellaris®LM3S8962 Ethernet+CAN 评估套件，打开终端，运行“su”，并输入 root 帐户密码，运行“openocd -f ./ek-lm3s8962.cfg”



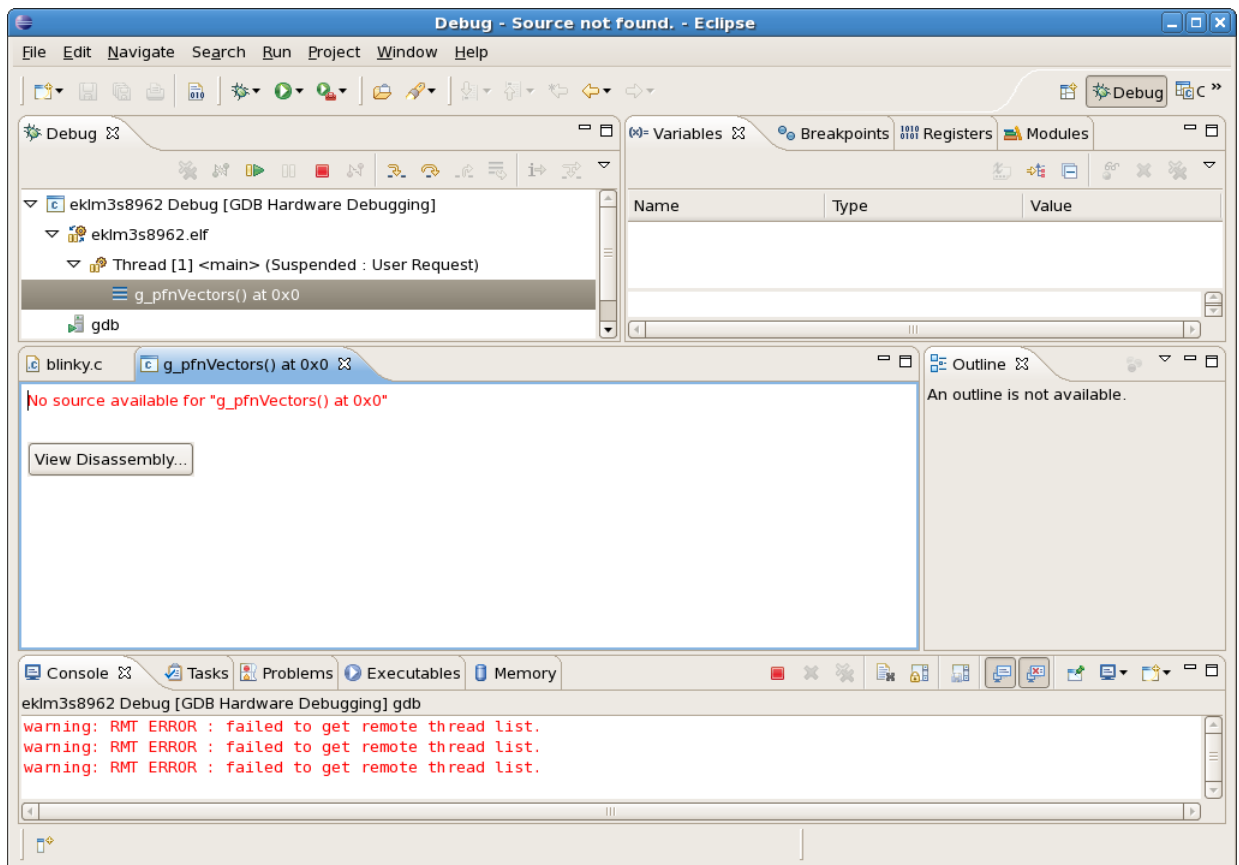
```
arci@localhost:/home/arci/workspace/eklm3s8962
文件(F) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)
[arci@localhost ek1m3s8962]$ su
口令:
[root@localhost ek1m3s8962]# openocd -f ./ek-lm3s8962.cfg
Open On-Chip Debugger 0.4.0 (2011-04-09-16:48)
Licensed under GNU GPL v2
For bug reports, read
    http://openocd.berlios.de/doc/doxygen/bugs.html
500 kHz
jtag_nsrst_delay: 100
srst_only separate srst_gates_jtag srst_open_drain
Info : clock speed 500 kHz
Info : JTAG tap: lm3s8962.cpu tap/device found: 0x3ba00477 (mfg: 0x23b, part: 0x
ba00, ver: 0x3)
Info : lm3s8962.cpu: hardware has 6 breakpoints, 4 watchpoints
█
```

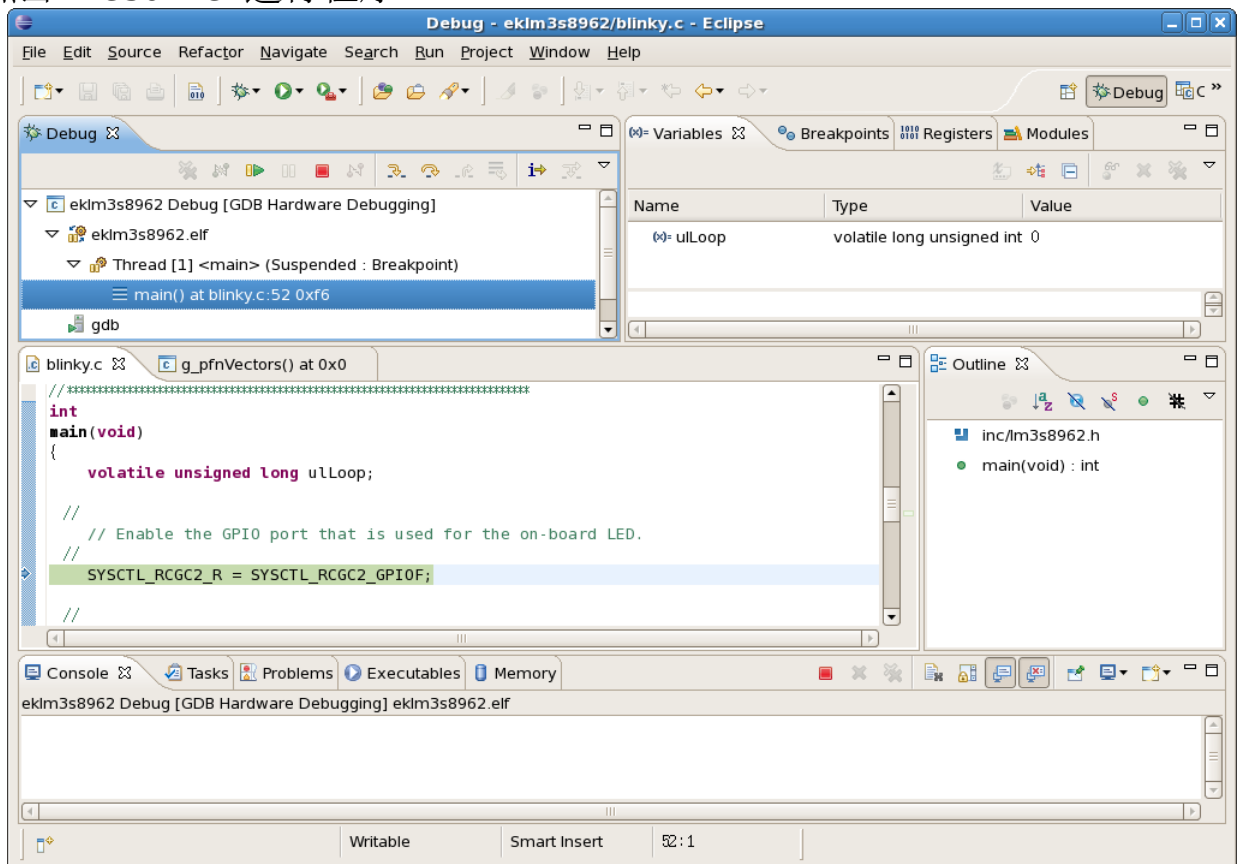
点击“Debug”



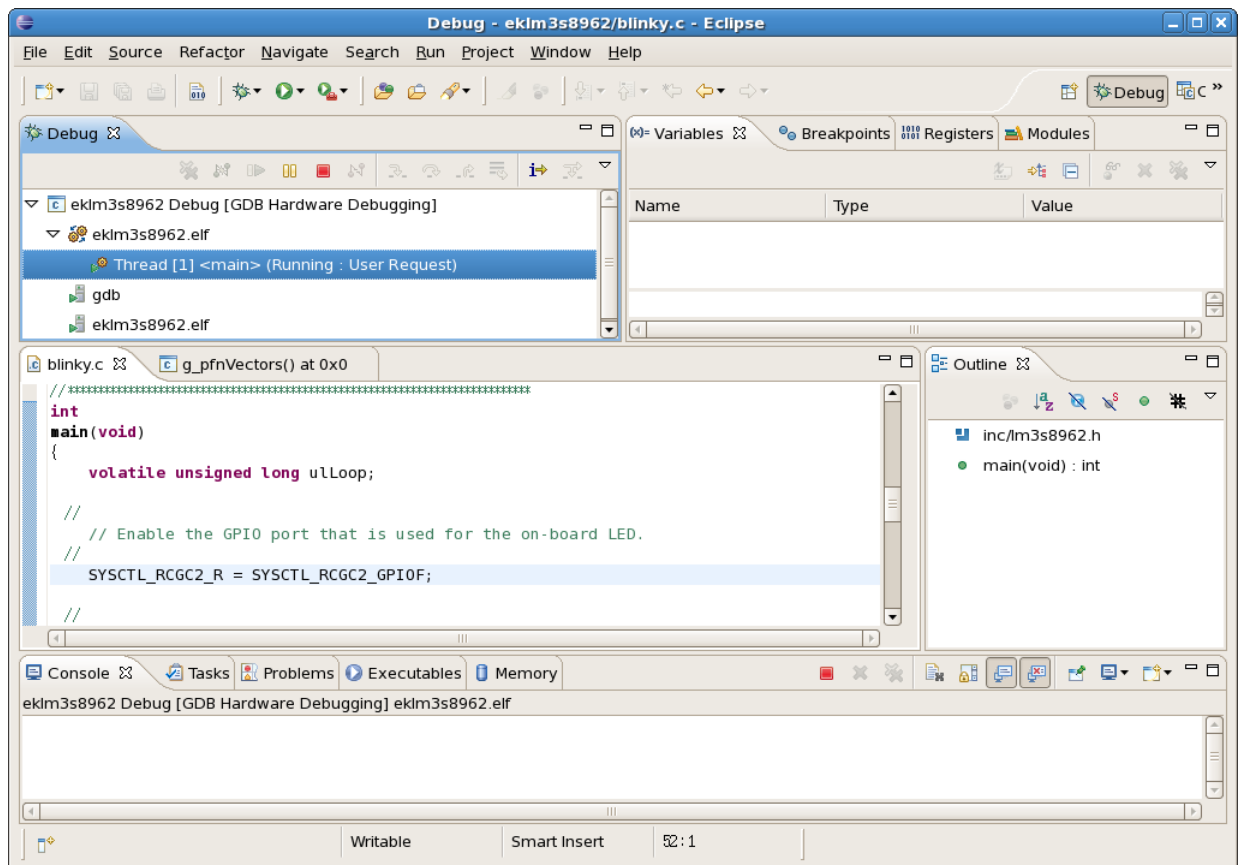
点击“Yes”



点击“Resume”运行程序



由于在“main”处设置了断点，因此程序暂停了下来，继续点击“Resume”运行程序。



可以观察到 Stellaris®LM3S8962 Ethernet+CAN 评估套件上的 LED 在闪烁。可以点击“Suspend”暂停或点击“Terminate”终止调试。

6、Virtual COM Port Drivers 安装

<http://www.ftdichip.com/Drivers/VCP.htm>

<http://ftdi-usb-sio.sourceforge.net/>

<http://sourceforge.net/projects/ftdi-usb-sio/>

Currently Supported VCP Drivers:

Operating System	Release Date	Processor Architecture							Comments
		x86 (32-bit)	x64 (64-bit)	PPC	ARM	MIPSII	MIPSIV	SH4	
Windows*	2011-02-28	2.08.12	2.08.12	-	-	-	-	-	Interim bug fix release Release notes
Windows*	2010-08-11	2.08.02	2.08.02	-	-	-	-	-	WHQL Certified Available as setup executable Release notes
Linux	2009-05-14	1.5.0	1.5.0	-	-	-	-	-	Included in 2.6.31 kernel and later ReadMe
Mac OS X	2011-02-28	2.2.16	2.2.16	2.2.16	-	-	-	-	Customers wishing to have a VID/PID combination added should contact FTDI Support
Windows CE 4.2-5.2**	2010-02-11	1.1.0.6	-	-	1.1.0.6	1.1.0.6	1.1.0.6	1.1.0.6	
Windows CE 6.0	2010-02-11	1.1.0.6	-	-	1.1.0.6	1.1.0.6	1.1.0.6	1.1.0.6	

*includes the following versions of the Windows operating system: Windows 2000, Windows XP, Windows Server 2003, Windows Vista, Windows Server 2008, Windows 7, Windows Server 2008 R2.

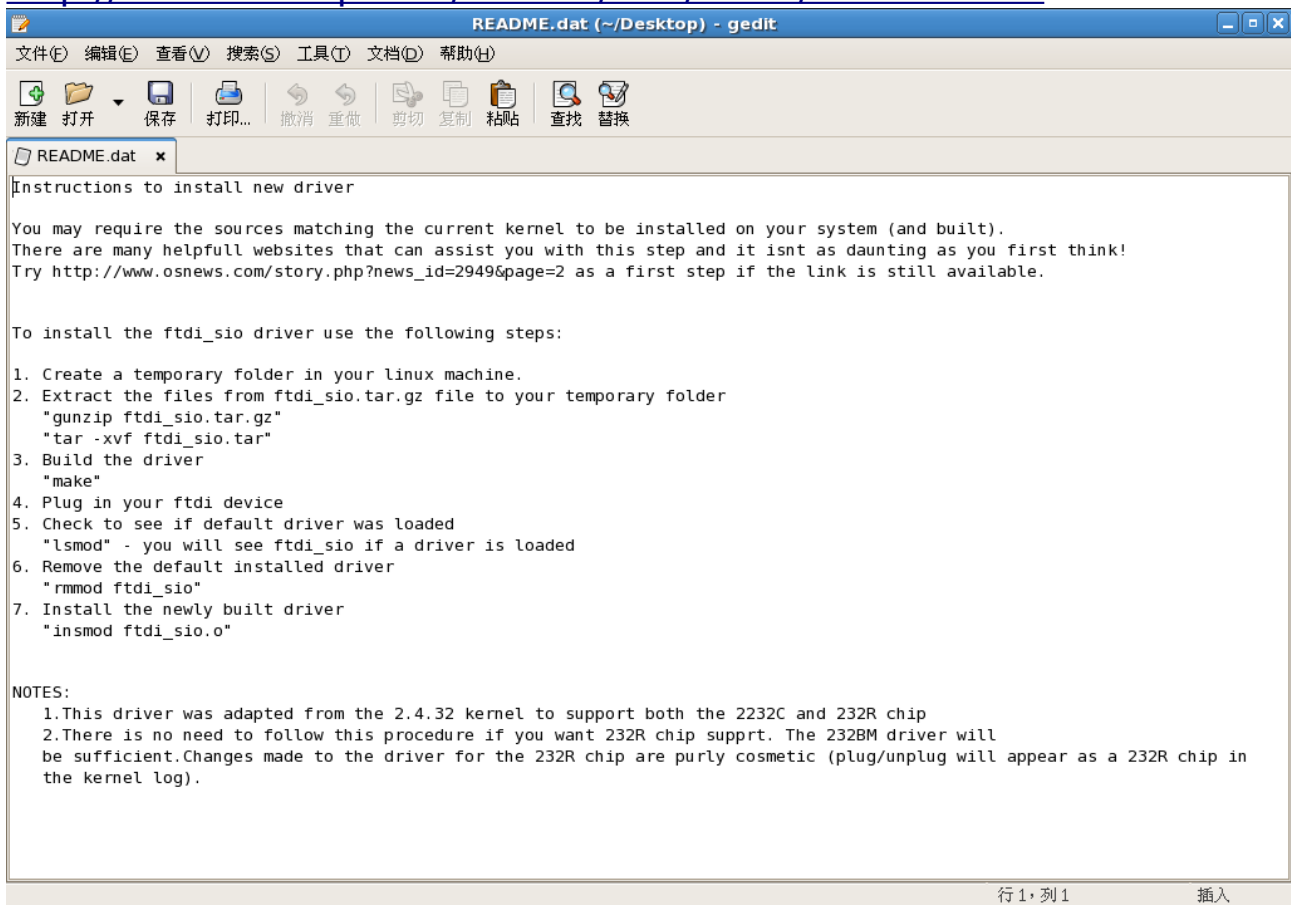
**includes the following versions of Windows CE 4.2-5.2 based operating systems: Windows Mobile 2003, Windows Mobile 2003 SE, Windows Mobile 5, Windows Mobile 6, Windows Mobile 6.1, Windows Mobile 6.5

http://www.ftdichip.com/Drivers/VCP/Linux/ftdi_sio.tar.gz

可以从 <http://www.ftdichip.com/Drivers/VCP.htm> 下载最新版的 Virtual COM Port Drivers

可以下载 ReadMe 文件查看帮助

<http://www.ftdichip.com/Drivers/VCP/Linux/README.dat>



根据 ReadMe 描述进行安装，解压“ftdi_sio.tar.gz”到当前用户主目录
打开终端，运行“su”，并输入 root 帐户密码
运行“make”

```
[arci@localhost ftdi_sio]$ su
```

口令:

```
[root@localhost ftdi_sio]# make
```

```
gcc -Wall -D__KERNEL__ -DMODULE -I/lib/modules/2.6.18-194.el5/build/include -D__SMP__  
-DSMP -DMODVERSIONS -include /lib/modules/2.6.18-  
194.el5/build/include/linux/modversions.h -I/usr/src/linux-2.6.18-194.el5/drivers/usb/serial/  
-O -c -o ftdi_sio.o ftdi_sio.c  
cc1: 错误: /lib/modules/2.6.18-194.el5/build/include/linux/modversions.h: 没有那个文件或目录
```

```
In file included from /lib/modules/2.6.18-194.el5/build/include/asm/thread_info.h:16,  
from /lib/modules/2.6.18-194.el5/build/include/linux/thread_info.h:21,  
from /lib/modules/2.6.18-194.el5/build/include/linux/preempt.h:9,  
from /lib/modules/2.6.18-194.el5/build/include/linux/spinlock.h:49,  
from /lib/modules/2.6.18-194.el5/build/include/linux/mmzone.h:7,  
from /lib/modules/2.6.18-194.el5/build/include/linux/gfp.h:4,  
from /lib/modules/2.6.18-194.el5/build/include/linux/slab.h:14,  
from ftdi_sio.c:254:
```

```
/lib/modules/2.6.18-194.el5/build/include/asm/processor.h:84: 错误:
```

```
'CONFIG_X86_L1_CACHE_SHIFT' 未声明 (不在函数内)
```

```
/lib/modules/2.6.18-194.el5/build/include/asm/processor.h:84: 错误: 要求的对齐边界不是常量
```

```
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/rwsem.h:24,  
from /lib/modules/2.6.18-194.el5/build/include/linux/notifier.h:14,  
from /lib/modules/2.6.18-194.el5/build/include/linux/memory_hotplug.h:7,  
from /lib/modules/2.6.18-194.el5/build/include/linux/mmzone.h:357,  
from /lib/modules/2.6.18-194.el5/build/include/linux/gfp.h:4,
```

```
from /lib/modules/2.6.18-194.el5/build/include/linux/slab.h:14,
from ftdi_sio.c:254:
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h: In function '__down_read':
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h:104: 错误: expected ':' or ')' before
'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h: In function '__down_write_nested':
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h:156: 错误: expected ':' or ')' before
'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h: In function '__up_read':
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h:198: 错误: expected ':' or ')' before
'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h:192: 警告: 未使用的变量 'tmp'
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h: In function '__up_write':
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h:224: 错误: expected ':' or ')' before
'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h: In function '__downgrade_write':
/lib/modules/2.6.18-194.el5/build/include/asm/rwsem.h:249: 错误: expected ':' or ')' before
'KBUILD_BASENAME'
在包含自 /lib/modules/2.6.18-194.el5/build/include/linux/sched.h: 49 的文件中,
    从 /lib/modules/2.6.18-194.el5/build/include/linux/radix-tree.h: 22,
    从 /lib/modules/2.6.18-194.el5/build/include/linux/fs.h: 295,
    从 /lib/modules/2.6.18-194.el5/build/include/linux/tty.h: 9,
    从 ftdi_sio.c: 255:
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:33:3: 错误: #error You lose.
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:250:31: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:294:46: 错误: #if 中用零做除数
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/sched.h:49,
    from /lib/modules/2.6.18-194.el5/build/include/linux/radix-tree.h:22,
    from /lib/modules/2.6.18-194.el5/build/include/linux/fs.h:295,
    from /lib/modules/2.6.18-194.el5/build/include/linux/tty.h:9,
    from ftdi_sio.c:255:
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h: In function 'jiffies_to_msecs':
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:299: 错误: 'CONFIG_HZ' 未声明 (在此
函数内第一次使用)
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:299: 错误: (即使在一个函数内多次出现,
每个未声明的标识符在其
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:299: 错误: 所在的函数内只报告一次。)
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:305:46: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h: In function 'jiffies_to_usecs':
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:310: 错误: 'CONFIG_HZ' 未声明 (在此
函数内第一次使用)
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:318:46: 错误: #if 中用零做除数
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h: In function 'msecs_to_jiffies':
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:323: 错误: 'CONFIG_HZ' 未声明 (在此
```

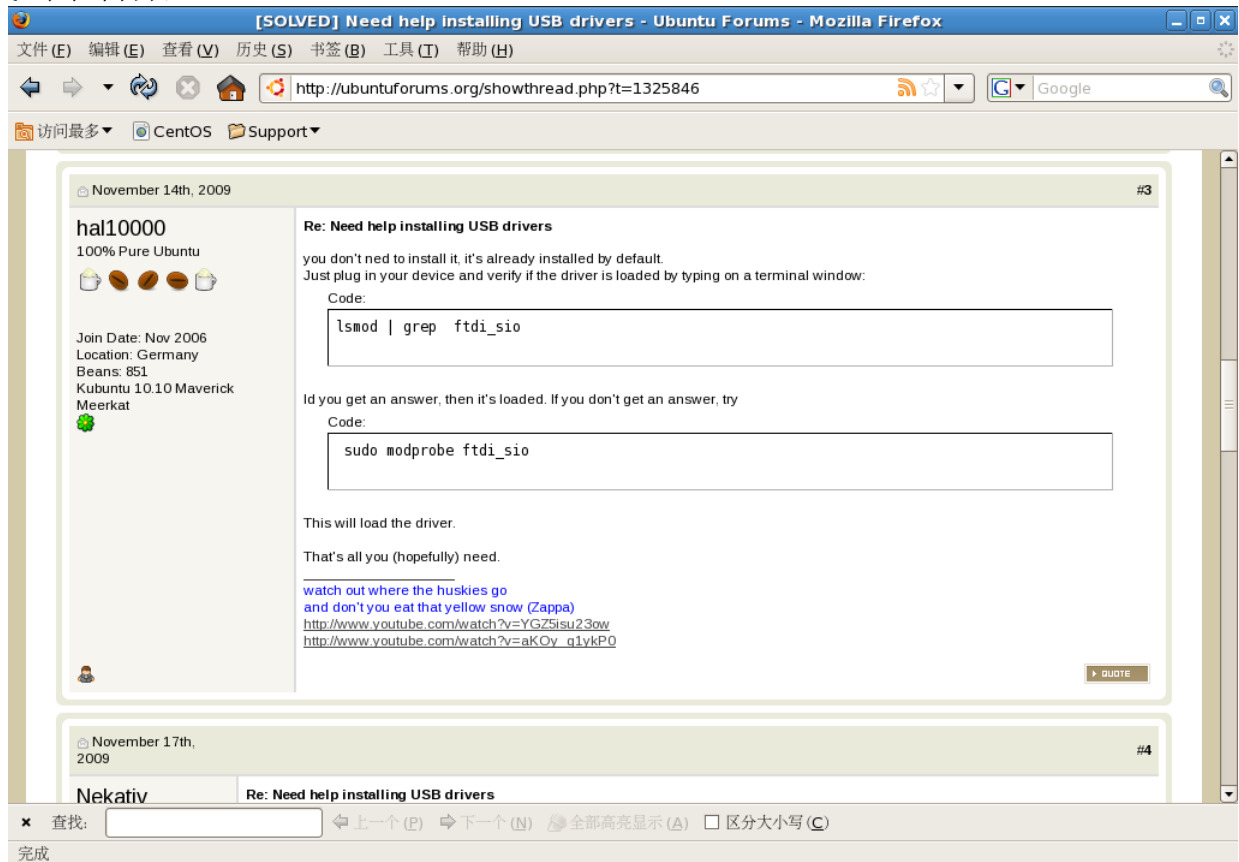

/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h: In function 'jiffies_64_to_clock_t':
/lib/modules/2.6.18-194.el5/build/include/linux/jiffies.h:457: 错误: 'CONFIG_HZ' 未声明 (在此函数内第一次使用)
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/sched.h:57,
from /lib/modules/2.6.18-194.el5/build/include/linux/radix-tree.h:22,
from /lib/modules/2.6.18-194.el5/build/include/linux/fs.h:295,
from /lib/modules/2.6.18-194.el5/build/include/linux/tty.h:9,
from ftdi_sio.c:255:
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h: In function 'down':
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h:105: 错误: expected ':' or ')' before 'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h: In function 'down_interruptible':
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h:130: 错误: expected ':' or ')' before 'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h: In function 'down_trylock':
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h:155: 错误: expected ':' or ')' before 'KBUILD_BASENAME'
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h: In function 'up':
/lib/modules/2.6.18-194.el5/build/include/asm/semaphore.h:179: 错误: expected ':' or ')' before 'KBUILD_BASENAME'
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/radix-tree.h:22,
from /lib/modules/2.6.18-194.el5/build/include/linux/fs.h:295,
from /lib/modules/2.6.18-194.el5/build/include/linux/tty.h:9,
from ftdi_sio.c:255:
/lib/modules/2.6.18-194.el5/build/include/linux/sched.h: In function 'dequeue_signal_lock':
/lib/modules/2.6.18-194.el5/build/include/linux/sched.h:1343: 警告: 隐式声明函数 'local_irq_save'
/lib/modules/2.6.18-194.el5/build/include/linux/sched.h:1345: 警告: 隐式声明函数 'local_irq_restore'
在包含自 /lib/modules/2.6.18-194.el5/build/include/linux/module.h: 24 的文件中,
从 /lib/modules/2.6.18-194.el5/build/include/asm/termios.h: 61,
从 /lib/modules/2.6.18-194.el5/build/include/linux/termios.h: 5,
从 /lib/modules/2.6.18-194.el5/build/include/linux/tty.h: 11,
从 ftdi_sio.c: 255:
/lib/modules/2.6.18-194.el5/build/include/asm/module.h:65:2: 错误: #error unknown processor family
在包含自 /lib/modules/2.6.18-194.el5/build/include/linux/irq.h: 22 的文件中,
从 /lib/modules/2.6.18-194.el5/build/include/asm/hardirq.h: 5,
从 /lib/modules/2.6.18-194.el5/build/include/linux/hardirq.h: 7,
从 /lib/modules/2.6.18-194.el5/build/include/linux/delay.h: 13,
从 /lib/modules/2.6.18-194.el5/build/include/linux/usb.h: 14,
从 ftdi_sio.c: 261:
/lib/modules/2.6.18-194.el5/build/include/asm/irq.h:15:25: 错误: irq_vectors.h: 没有那个文件或目录
In file included from /lib/modules/2.6.18-194.el5/build/include/asm/hardirq.h:5,
from /lib/modules/2.6.18-194.el5/build/include/linux/hardirq.h:7,
from /lib/modules/2.6.18-194.el5/build/include/linux/delay.h:13,
from /lib/modules/2.6.18-194.el5/build/include/linux/usb.h:14,
from ftdi_sio.c:261:
/lib/modules/2.6.18-194.el5/build/include/linux/irq.h: 在顶层:
/lib/modules/2.6.18-194.el5/build/include/linux/irq.h:167: 错误: 要求的对齐边界不是常量
/lib/modules/2.6.18-194.el5/build/include/linux/irq.h:169: 错误: 'NR_IRQS' 未声明 (不在函数内)
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/irq.h:182,
from /lib/modules/2.6.18-194.el5/build/include/asm/hardirq.h:5,
from /lib/modules/2.6.18-194.el5/build/include/linux/hardirq.h:7,
from /lib/modules/2.6.18-194.el5/build/include/linux/delay.h:13,
from /lib/modules/2.6.18-194.el5/build/include/linux/usb.h:14,

from ftdi_sio.c:261:
/lib/modules/2.6.18-194.el5/build/include/asm/hw_irq.h:31: 错误: 'NR_IRQ_VECTORS' 未声明
(不在函数内)
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/hardirq.h:7,
from /lib/modules/2.6.18-194.el5/build/include/linux/delay.h:13,
from /lib/modules/2.6.18-194.el5/build/include/linux/usb.h:14,
from ftdi_sio.c:261:
/lib/modules/2.6.18-194.el5/build/include/asm/hardirq.h:12: 错误: 要求的对齐边界不是常量
In file included from /lib/modules/2.6.18-194.el5/build/include/linux/usb.h:15,
from ftdi_sio.c:261:
/lib/modules/2.6.18-194.el5/build/include/linux/interrupt.h: In function 'cli':
/lib/modules/2.6.18-194.el5/build/include/linux/interrupt.h:193: 警告: 隐式声明函数
'local_irq_disable'
/lib/modules/2.6.18-194.el5/build/include/linux/interrupt.h: In function 'sti':
/lib/modules/2.6.18-194.el5/build/include/linux/interrupt.h:197: 警告: 隐式声明函数
'local_irq_enable'
/lib/modules/2.6.18-194.el5/build/include/linux/interrupt.h: In function 'save_flags':
/lib/modules/2.6.18-194.el5/build/include/linux/interrupt.h:201: 警告: 隐式声明函数
'local_save_flags'
ftdi_sio.c: 在顶层:
ftdi_sio.c:293: 错误: 字段 'rx_work' 的类型不完全
ftdi_sio.c:632: 警告: 'struct ktermios' 在形参表内部声明
ftdi_sio.c:632: 警告: 它的作用域仅限于此定义或声明, 这可能并不是您想要的
ftdi_sio.c:653: 错误: 初始值设定项里有未知的字段 'usb_driver'
ftdi_sio.c:653: 警告: 从不兼容的指针类型初始化
ftdi_sio.c:669: 警告: 从不兼容的指针类型初始化
ftdi_sio.c:670: 警告: 从不兼容的指针类型初始化
ftdi_sio.c:674: 警告: 从不兼容的指针类型初始化
ftdi_sio.c: In function 'get_ftdi_divisor':
ftdi_sio.c:957: 警告: 隐式声明函数 'tty_encode_baud_rate'
ftdi_sio.c: In function 'ftdi_sio_port_probe':
ftdi_sio.c:1303: 警告: 隐式声明函数 'INIT_DELAYED_WORK'
ftdi_sio.c: In function 'ftdi_open':
ftdi_sio.c:1430: 警告: 传递参数 2 (属于 'ftdi_set_termios')时在不兼容的指针类型间转换
ftdi_sio.c:1447: 警告: 传递参数 6 (属于 'usb_fill_bulk_urb')时在不兼容的指针类型间转换
ftdi_sio.c: In function 'ftdi_write':
ftdi_sio.c:1591: 警告: 传递参数 6 (属于 'usb_fill_bulk_urb')时在不兼容的指针类型间转换
ftdi_sio.c: In function 'ftdi_process_read':
ftdi_sio.c:1767: 警告: 在 '__mptr' 的声明中, 类型默认为 'int'
ftdi_sio.c:1767: 警告: 从不兼容的指针类型初始化
ftdi_sio.c:1951: 警告: 传递参数 6 (属于 'usb_fill_bulk_urb')时在不兼容的指针类型间转换
ftdi_sio.c: 在顶层:
ftdi_sio.c:1997: 警告: 'struct ktermios' 在形参表内部声明
ftdi_sio.c:1998: 错误: 与 'ftdi_set_termios' 类型冲突
ftdi_sio.c:632: 错误: 'ftdi_set_termios' 的上一个声明在此
ftdi_sio.c: In function 'ftdi_set_termios':
ftdi_sio.c:2001: 警告: 从不兼容的指针类型初始化
ftdi_sio.c:2002: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2007: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2014: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2023: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2026: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2037: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2087: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2118: 错误: 提领指向不完全类型的指针
ftdi_sio.c:2119: 错误: 提领指向不完全类型的指针
ftdi_sio.c: In function 'ftdi_ioctl':
ftdi_sio.c:2234: 警告: 'interruptible_sleep_on' 已过时(于 /lib/modules/2.6.18-
194.el5/build/include/linux/wait.h:375 声明)

make: *** [ftdi_sio.o] 错误 1

[root@localhost ftdi_sio]#

提示一堆错误，我也不知道该怎么办，上 google 搜索，经历 30 多分钟终于找到了答案



按照说明进行操作，必须登录“root”帐户才能操作，问题解决，不需要进行编译安装。



参考: <http://nattster.siamdev.net/2010/02/getting-a-ftdi-usb-to-serial-converter-to-work-on-ubuntu-9-10/>

Getting a FTDI USB-to-Serial converter to work on Ubuntu 9.10

I bought a USB-to-Serial converter from ETTeam.com and test it with Ubuntu 9.10 (Karmic kernel 2.6.31-18-generic.) I've found that it doesn't show as `/dev/ttyUSB0` as other generic USB-to-Serial converter do.

I've been googling for the solution for a while and found this bug report: [ftdi serial driver broken in linux-image-2.6.31-14-generic \(2.6.31-14.48\)](#) It said that the fix is released with `linux-kernel 2.6.32-13.18`.

So I download a new 2.6.32 kernel package (.deb) from [Ubuntu's kernel-ppa](#). I installed these package with a command:

```
sudo dpkg -i *.deb
```

Now, I can load a `ftdi_sio` (FTDI Serial Input/Output) driver with a `modprobe` command. But it doesn't recognize my device yet. I ran a `lsusb` command and found that my converter has a different Product ID. (It might be customized by ETTeam.com)

```
$ lsusb
Bus 005 Device 005: ID 0403:e2e6 Future Technology Devices International, Ltd
```

(0403 = vendor ID, e2e6 = product ID)

To get it work, I have to run the following command:

```
$ sudo modprobe ftdi_sio vendor=0x0403 product=0xe2e6
```

Then I replug the converter and it is shown as `/dev/ttyUSB0` now!

正在从 www.etteam.com 传送数据...

连接 Stellaris® LM3S8962 Ethernet + CAN 评估套件, 按照说明进行操作, 必须登录“root”帐户才能操作

```
root@localhost:~
文件(E) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)

[root@localhost ~]# lsusb
Bus 001 Device 001: ID 0000:0000
Bus 002 Device 003: ID 0403:bcd8 Future Technology Devices International, Ltd Stellaris Development Board
Bus 002 Device 001: ID 0000:0000
Bus 002 Device 002: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
[root@localhost ~]# modprobe ftdi_sio vendor=0x0403 product=0xbcd8
[root@localhost ~]#
```

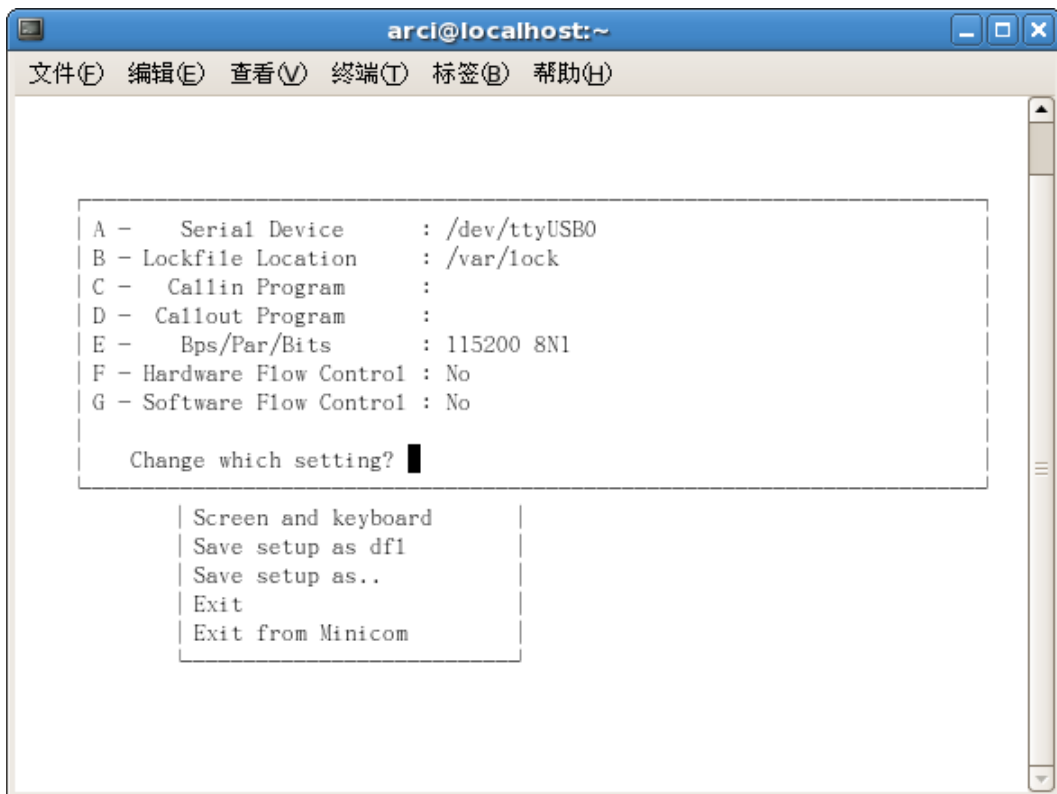
执行完以上操作后可以在“/dev/”目录中看到“ttyUSB0”



运行“minicom -s”



向下移动到“Serial port setup”，按回车



```
arci@localhost:~
文件(E) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)

A - Serial Device      : /dev/ttyUSB0
B - Lockfile Location  : /var/lock
C - Callin Program    :
D - Callout Program   :
E - Bps/Par/Bits      : 115200 8N1
F - Hardware Flow Control : No
G - Software Flow Control : No

Change which setting? █

| Screen and keyboard |
| Save setup as df1  |
| Save setup as..   |
| Exit               |
| Exit from Minicom  |
```

按“A”键修改“Serial Device”为“/dev/ttyUSB0”

按“E”键修改“Bps/Par/Bits”为“115200 8N1”

按“E”键修改“Hardware Flow Control”为“No”

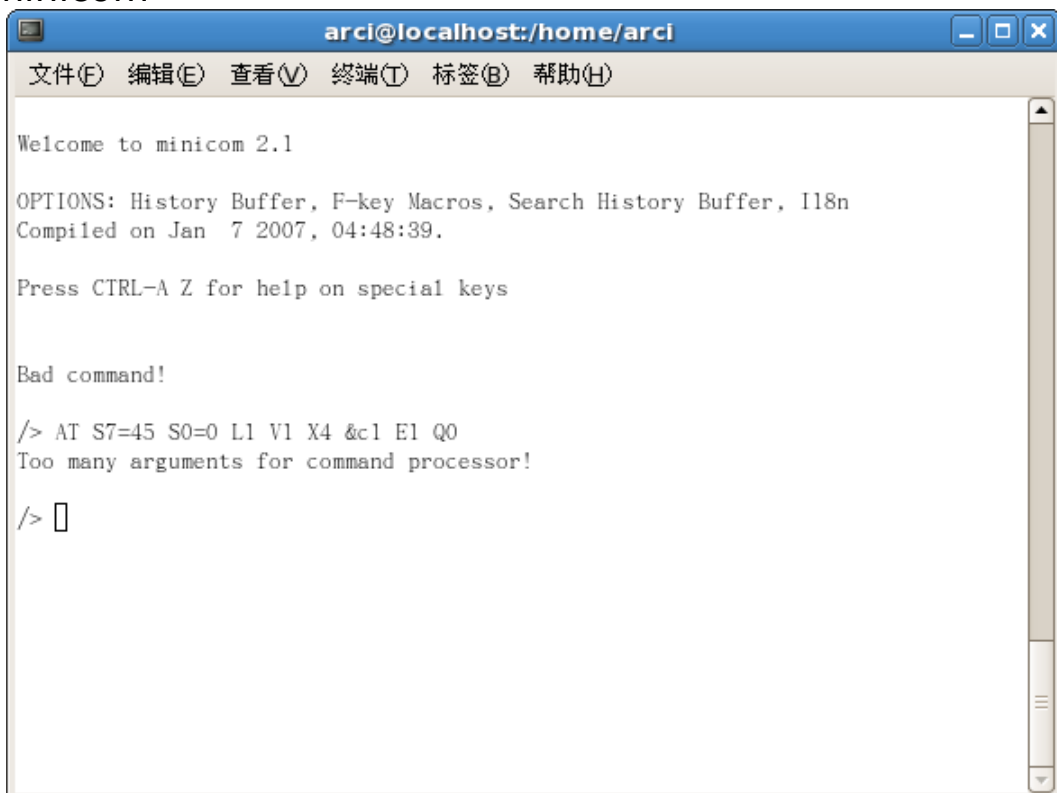
按回车

向下移动到“Save setup as df1”，按回车，保存设置

向下移动到“Exit from Minicom”，按回车，退出

切换回普通用户，打开终端，运行“su”，并输入“root”帐户密码

运行“minicom”



```
arci@localhost:/home/arci
文件(E) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)

Welcome to minicom 2.1

OPTIONS: History Buffer, F-key Macros, Search History Buffer, 118n
Compiled on Jan  7 2007, 04:48:39.

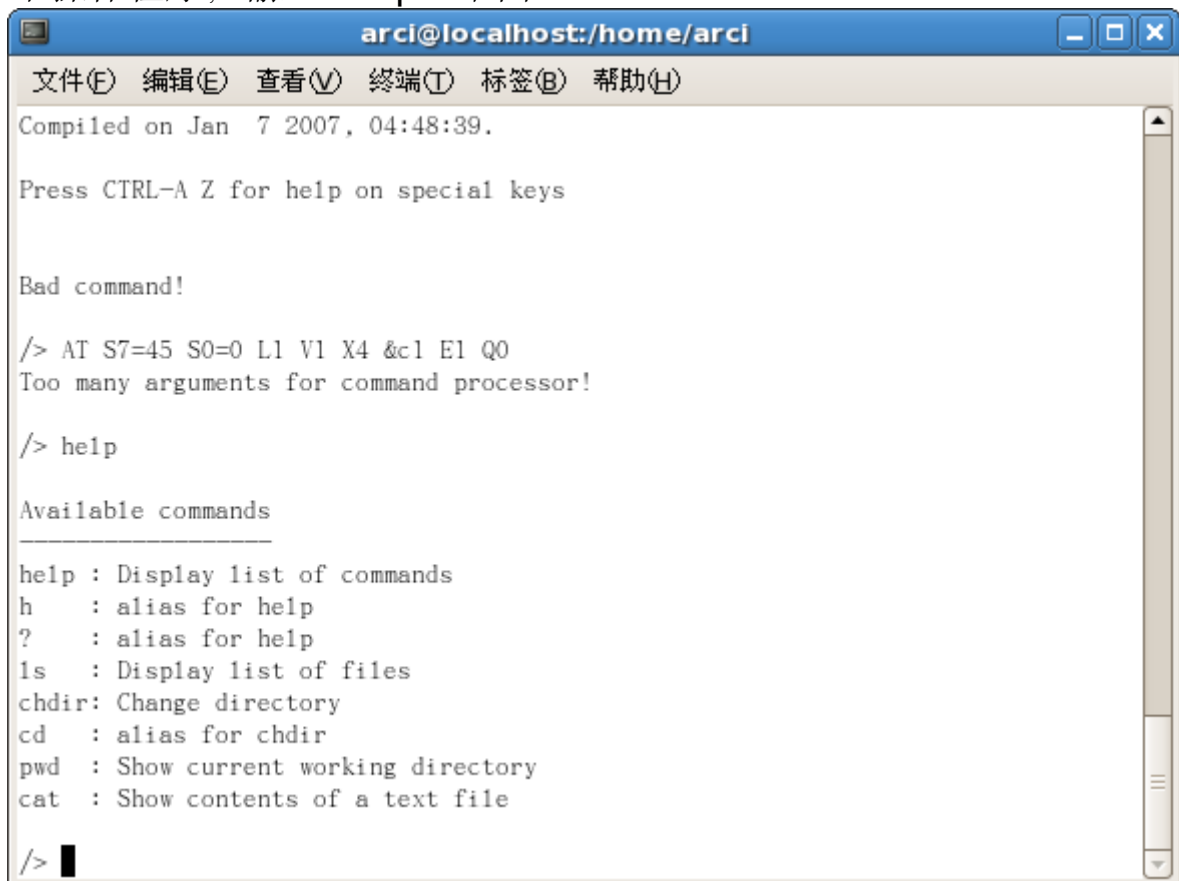
Press CTRL-A Z for help on special keys

Bad command!

/> AT S7=45 S0=0 L1 V1 X4 &c1 E1 Q0
Too many arguments for command processor!

/> █
```

连接成功，此时 Stellaris®LM3S8962 Ethernet+CAN 评估套件运行的为 SD 卡操作程序，输入“help”+回车



```
arci@localhost:/home/arci
文件(F) 编辑(E) 查看(V) 终端(T) 标签(B) 帮助(H)
Compiled on Jan  7 2007, 04:48:39.

Press CTRL-A Z for help on special keys

Bad command!

/> AT S7=45 S0=0 L1 V1 X4 &c1 E1 Q0
Too many arguments for command processor!

/> help

Available commands
-----
help : Display list of commands
h    : alias for help
?    : alias for help
ls   : Display list of files
chdir: Change directory
cd   : alias for chdir
pwd  : Show current working directory
cat  : Show contents of a text file

/> █
```

Virtual COM Port Drivers 安装测试完成。