在 Ubuntu 12.04 上用 LTIB 编译 linux BSP

环境：

PC: VMware Player   Ubuntu 12.04 LTS

Linux BSP Source Code: L3.0.35_4.1.0_ER_SOURCE_BSP

开发板：i.MX6DL-SDP

一、准备工作：

1、Ubuntu 12.04 LTS 安装（详细步骤这里不再详述，方法在之前文档中有详细介绍）。

2、下载 Linux BSP Source Code 并将其拷贝到 ubuntu 下

下载地址链接为：

http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=RDIMX6SABREPLAT&fpsp=1&tab=Design_Tools_Tab

L3.0.35_4.1.0_ER_SOURCE_BSP   : i.MX 6Quad, i.MX 6Dual, i.MX 6DualLite, i.MX 6Solo and i.MX 6Sololite Linux BSP Source Code   FREESCALE   Download   ☆
Files.
Size (K): 1086744 Format: gz Rev #: L3.0.35_4.1.0 Modified: 9/5/2013
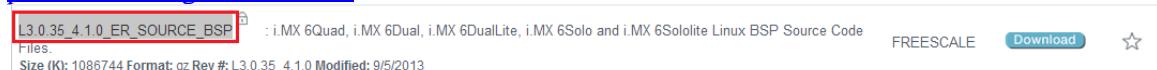
二、编译 Linux BSP

1、设置 linux host 环境

（1）更新 ubuntu packages
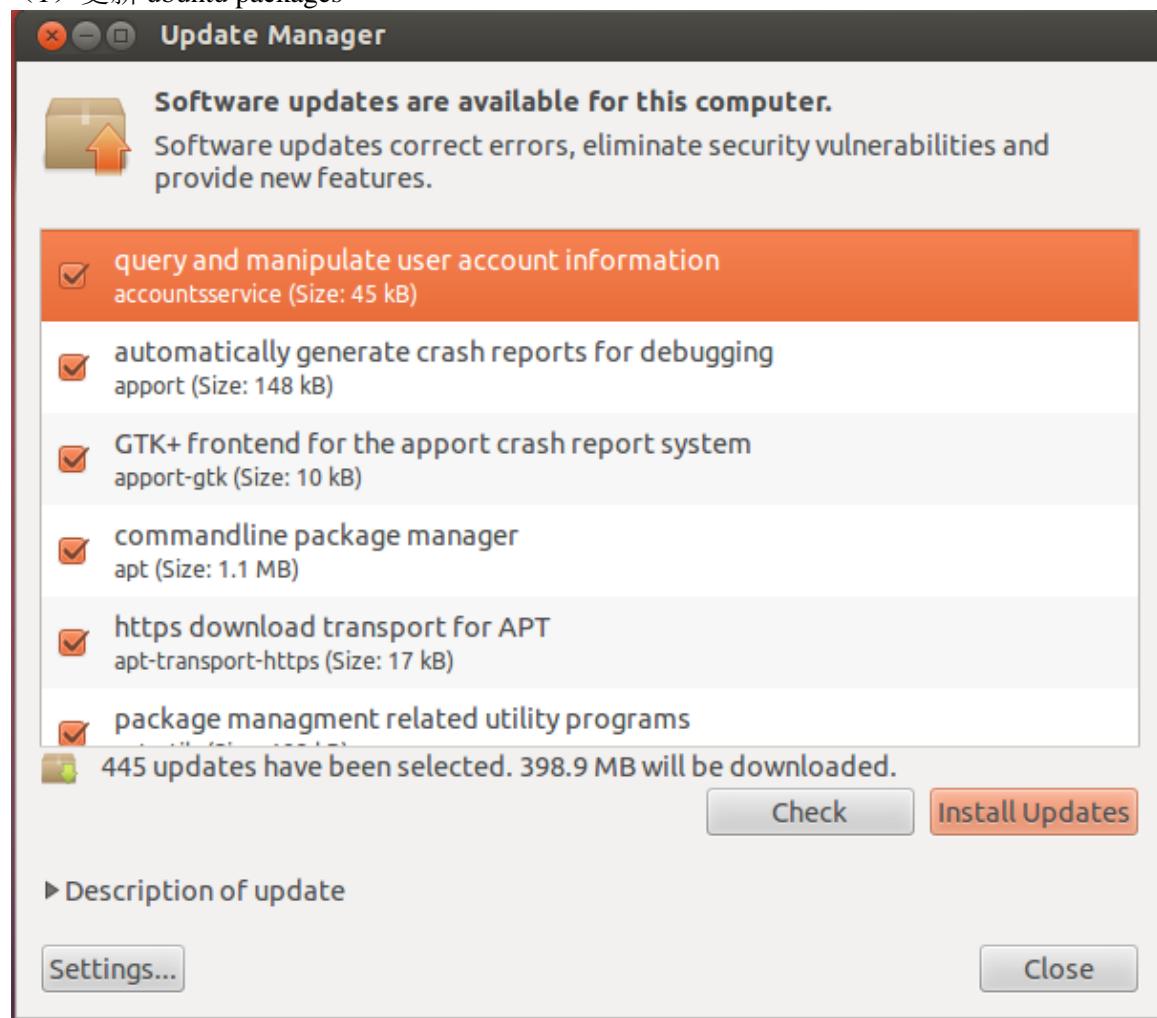
（2）Update source list（源很重要，源有问题的话会出现很多错误，建议更新一下）

#sudo cp /etc/apt/sources.list /etc/apt/sources.list.bak (**backup original file**)

#sudo gedit /etc/apt/sources.list

Delete all item in this file, then copy the following server addresses to it :
deb http://mirrors.163.com/ubuntu/ precise main restricted
deb-src http://mirrors.163.com/ubuntu/ precise main restricted
deb http://mirrors.163.com/ubuntu/ precise-updates main restricted
deb-src http://mirrors.163.com/ubuntu/ precise-updates main restricted
deb http://mirrors.163.com/ubuntu/ precise universe
deb-src http://mirrors.163.com/ubuntu/ precise universe
deb http://mirrors.163.com/ubuntu/ precise-updates universe
deb-src http://mirrors.163.com/ubuntu/ precise-updates universe
deb http://mirrors.163.com/ubuntu/ precise multiverse
deb-src http://mirrors.163.com/ubuntu/ precise multiverse
deb http://mirrors.163.com/ubuntu/ precise-updates multiverse
deb-src http://mirrors.163.com/ubuntu/ precise-updates multiverse
deb http://mirrors.163.com/ubuntu/ precise-backports main restricted universe multiverse
deb-src http://mirrors.163.com/ubuntu/ precise-backports main restricted universe multiverse
deb http://mirrors.163.com/ubuntu/ precise-security main restricted
deb-src http://mirrors.163.com/ubuntu/ precise-security main restricted
deb http://mirrors.163.com/ubuntu/ precise-security universe
deb-src http://mirrors.163.com/ubuntu/ precise-security universe
deb http://mirrors.163.com/ubuntu/ precise-security multiverse
deb-src http://mirrors.163.com/ubuntu/ precise-security multiverse
deb http://extras.ubuntu.com/ubuntu precise main
deb-src http://extras.ubuntu.com/ubuntu precise main
保存并退出。
运行如下命令来更新 source list:
#sudo apt-get update
（3）Sudoers
在命令行窗口输入命令：sudo /usr/sbin/visudo
在User privilege specification
root ALL=(ALL) ALL 后面加入（强调一下 ubuntu 是 usrname）
ubuntu ALL = NOPASSWD: /usr/bin/rpm, /opt/freescale/ltib/usr/bin/rpm
（4）Install Host Packages Needed by LTIB
#!/bin/bash
# Install packages needed by LTIB（首先要先安装aptitude：**sudo apt-get install aptitude**）
sudo aptitude -y install gettext libgtk2.0-dev rpm bison m4 libfreetype6-dev
sudo aptitude -y install libdbus-glib-1-dev liborbit2-dev intltool
sudo aptitude -y install ccache ncurses-dev zlib1g zlib1g-dev gcc g++ libtool
sudo aptitude -y install uuid-dev liblzo2-dev
sudo aptitude -y install tcl dpkg
sudo aptitude -y install asciidoc texlive-latex-base dblatex xutils-dev
sudo apt-get install texinfo
# **Packages required for 64-bit Ubuntu**
# Do "uname -a" and see if the word "x86_64" shows up.
if uname -a|grep -sq 'x86_64'; then
sudo aptitude -y install ia32-libs libc6-dev-i386 lib32z1
# **The following recommended for Linux development**.
# They are not required by LTIB.
sudo aptitude -y install gparted emacs22-nox openssh-server
sudo aptitude -y install nfs-common nfs-kernel-server lintian
sudo aptitude -y install git-core git-doc git-email git-gui gitk
sudo aptitude -y install diffstat indent tofrodos fakeroot doxygen uboot-mkimage
sudo aptitude -y install sendmail mailutils meld atftpd sharutils
sudo aptitude -y install manpages-dev manpages-posix manpages-posix-dev linux-doc
sudo aptitude -y install vnc4server xvnc4viewer

2、安装并编译
（1）移走之前所有安装在/opt/freescale/pkgs下的包。
（2）安装 LTIB package，例如在/home/ubuntu/Desktop/imx6下（这是
L3.0.35_4.1.0_130816_source.tar.gz放置的目录
  tar zxvf L3.0.35_4.1.0_130816_source.tar.gz −−−−−−−−−−解压
  进到目录 L3.0.35_4.1.0_130816_source 下执行. /install 命令 −−−−−−−−−−−−安装
然后会出现如下：
You are about to install the LTIB (GNU/Linux Target Image Builder)

Before installing LTIB, you must read and accept the EULA
(End User License Agreement) which will be presented next.

Do you want to continue ? Y/n
Y
Hit enter to continue:
FREESCALE SEMICONDUCTOR SOFTWARE LICENSE AGREEMENT
………………..
………………..
………………..

I have read and accept the EULA (yes/no):
yes

The LTIB files are extracted from a tar file which includes the
prefix ltib. After installation you will find LTIB in:
/home/ubuntu/Desktop/imx6/L3.0.35_4.1.0_130816_source/ltib

Where do you want to install LTIB ? (/home/ubuntu/Desktop/imx6/L3.0.35_4.1.0_130816_source)
/home/ubuntu/Desktop/ltib   ------------------输入你要安装的**LTIB** 位置，然后回车

………………..
………………..
………………..

Copying packages to /home/ubuntu/Desktop/ltib/ltib/pkgs

Installation complete, your ltib installation has been placed in
/home/ubuntu/Desktop/ltib/ltib, to complete the installation:

cd /home/ubuntu/Desktop/ltib/ltib
./ltib
接着输入命令： **cd /home/ubuntu/Desktop/ltib/ltib**
                  ./ltib
Installing host support packages.

This only needs to be done once per host, but may take up to
an hour to complete ...

If an error occurs, a log file with the full output may be found in:
/home/ubuntu/Desktop/ltib/ltib/host_config.log

没有错误的话，会出现如下窗口，Freescale i.MX reference boards 退出并保存。
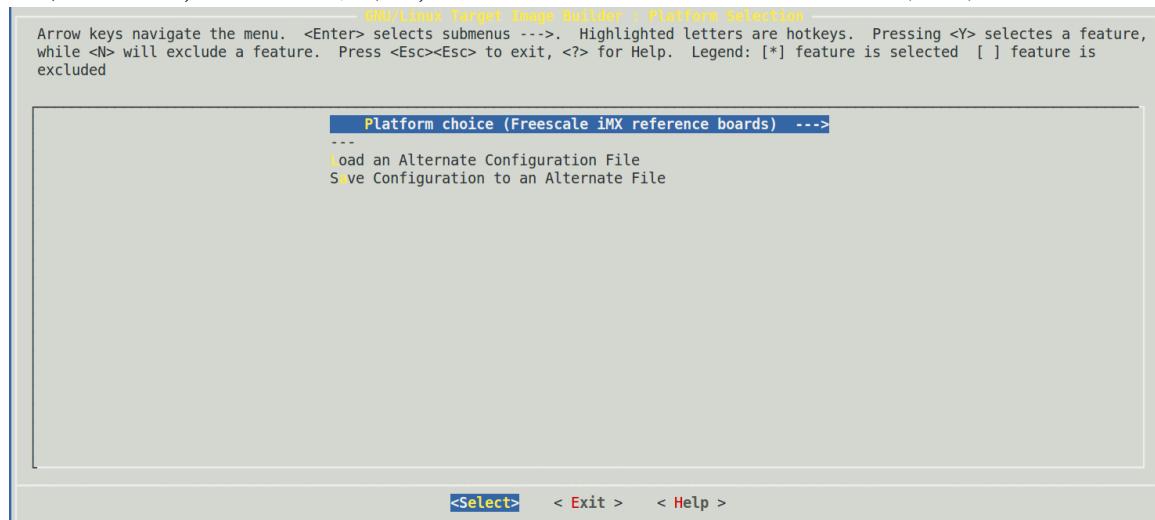
然后出现 i.MX 平台的选择：

选择 imx6q 及 package profile（Min profile），退出并保存。
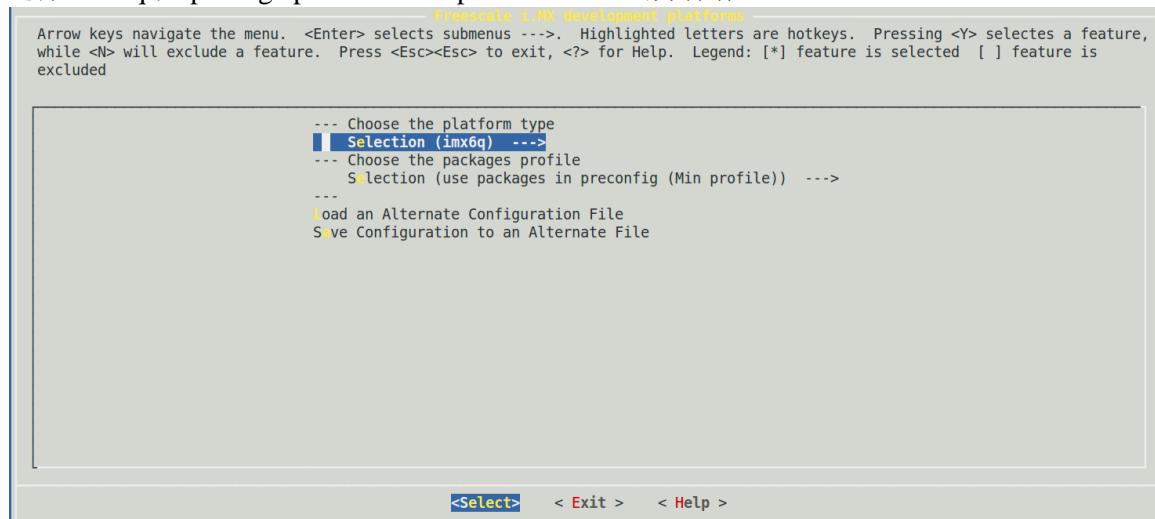
接着要选择 u-boot，开发板为 i.MX6DL-SDP，所以这里选择 mx6dl_sabresd，退出并保存。
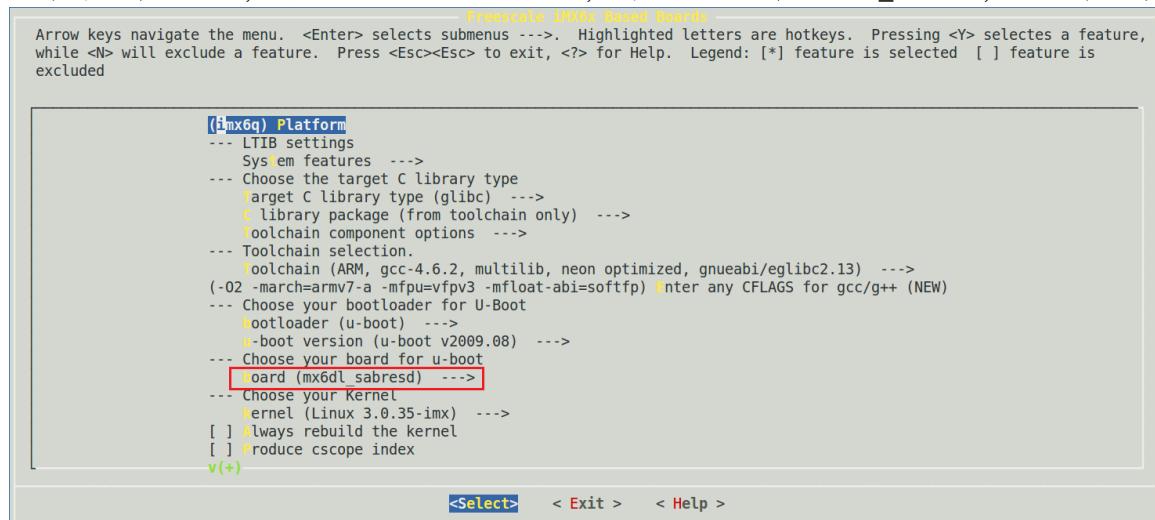
出现 failed buding busybox，这时候要执行如下操作：

1）在 /usr/include 下创建一个软链接：

    sudo ln -s i386-linux-gun/sys sys

2）修改 ltib/dist/lfs-5.1/base_libs/base_libs.spec（注释#部分）

    ...

    perl -w -e '

    # @ARGV = grep { `file $_` =~ m,ASCII C program text, } @ARGV;

    # exit (0) unless @ARGV;

然后在 ltib 下运行./ltib，编译成功，如下图所示：

```
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making filesystem image file
staging directory is /home/ubuntu/Desktop/ltib/ltib/rootfs.tmp
removing the boot directory and files
removing man files and directories
removing info files
removing /usr/share/locale directory
removing static libraries
removing target rpm database
stripping binaries and libraries

Filesystem stats, including padding:

    Total size           = 44556k
    Total number of files = 1611


Your ramdisk exceeds the old default size of 4096k, you may need to
set the command line argument for ramdisk_size in your bootloader
allowing 10% free this gives 49011k .  For instance, for u-boot:


setenv bootargs root=/dev/ram rw ramdisk_size=49011

creating an ext2 compressed filesystem image: rootfs.ext2.gz
genext2fs: Running in LTIB backwards compatibility mode: -i -> -N

Started: Tue Feb 11 16:15:52 2014
Ended:   Tue Feb 11 16:22:33 2014
Elapsed: 401 seconds

Build Succeeded

ubuntu@ubuntu-virtual-machine:~/Desktop/ltib/ltib$
```

在这里需要注意的是，如果操作系统是 Ubuntu12.04，需要有如下操作才可以成功编译：

A、sudo apt-get install texinfo

B、 modify ltib/dist/lfs-5.1/base_libs/base_libs.spec.

    ...

    perl -w -e '

    # @ARGV = grep { `file $_` =~ m,ASCII C program text, } @ARGV;

    # exit (0) unless @ARGV

成功编译以后，kernel image 和 U-Boot images 就在rootfs/boot/下面了。

参考文档：
1、i.MX_6Solo6DualLite_SABRE-SDP_Linux_User's_Guide.pdf
2、i.MX_6Solo6DualLite_SABRE-SDP_Linux_Release_Notes.pdf
3、Setting_Up_LTIB_host.pdf