Linux BSP and Toolchain QuickStart Guide
BSP Documentation

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Abstract

This document describes how to install and use Logic's Linux Board Support Package (BSP) and Toolchain.

REVISION HISTORY

REV	EDITOR	DESCRIPTION	APPROVAL	DATE
A	Sam Siciliano	Release	HAR	11/04/2005

1 Introduction

This document describes how to install and use Logic Product Development's Linux Toolchain and Board Support Package (BSP). The Linux toolchain allows users to cross-compile custom configured Linux Operating Systems for their ColdFire Development Kits. Included with the toolchain is Logic's Linux BSP, a Linux solution in development that will support the Fire Engine SOM-ETX peripherals.

2 System Requirements

The following are requirements to build the Linux toolchain and BSP as described in this document.

2.1 Linux Workstation Requirements

- A high performance, dedicated machine with a Linux distribution installed. The Linux toolchain and BSP have successfully been built on the following distributions:

  □ Fedora Core 3 & 4
  □ SuSe 9.3
  □ Gentoo

- All software development packages bundled with the distribution must be included.

- Root access is required for one of the steps in the installation process.

- 250 MB of free disk space is required for binaries.

- 2 GB of free disk space is required to build source.

2.2 ColdFire Kit Requirements

- A Logic ColdFire Development Kit is required. The Linux build scripts will support each model number and configuration.

- A programmed Complex Programmable Logic Device (CPLD) is required for CompactFlash® support.

- LogicLoader™ (LoLo) version 2.0.3 or higher loaded on the Fire Engine. The latest version of LoLo is available for download from Logic's website: https://www.logicpd.com/auth/login.php. Registration is required to download from the website, please refer to the Support section of Logic's website for instructions on creating an account: https://www.logicpd.com/support/.

WARNING: If dBug™ is loaded in the first block of NOR flash and LogicLoader is in the second, LogicLoader will be corrupted when running the Linux image. Avoid this by updating the development kit with a LogicLoader-only bootloader update image. Do not use bootloader update images that contain both dBug and LogicLoader.

3   Preparation

1. Log into an account on the Linux workstation that does not have root access.

2. Create a directory to contain the toolchain and BSP.

3. Download the files "LinuxTools-X.X.X.tar.bz2" and "LinuxBSP-22012005-X.X.X.tar.bz2" from the Logic website into the recently created directory (X.X.X represents the version tag).This can be accomplished using either a web browser or the "wget" command.

4   Unpackaging the Toolchain and Linux BSP

This section describes how to unpackage the Toolchain and Linux BSP.

4.1   Unpackaging the Toolchain

Extract the toolchain using the following command:

```
[cfdev@localhost lpdlinux_rel1]$ bunzip2 < LinuxTools-X.X.X.tar.bz2 | tar
xf –
[cfdev@localhost lpdlinux_rel1]$
```

This command will take a few minutes to complete.

4.2   Unpackaging the Linux BSP

Navigate back to the directory containing "LinuxTools" and the downloaded files, and extract the BSP in the same manner as the toolchain.

```
[cfdev@localhost LinuxTools]$ cd ..
[cfdev@localhost lpdlinux_rel1]$ bunzip2 < LinuxBSP-22012005-X.X.X.tar.bz2 | tar
xf –
[cfdev@localhost lpdlinux_rel1]$
```

This will also take a few minutes to complete.

5   Building the Toolchain

5.1   Create /opt/logicpd Directory

Create the directory /opt/logicpd. This requires root access on most systems, so use the "sudo" or "su" command. **Note: If the "su" command is used, be sure to use the "exit" command when completing this section. The toolchain should be build with an account that does not have root privileges.**

```
[cfdev@localhost lpdlinux _rel1]$ sudo mkdir -p /opt/logicpd
Password:
[cfdev@localhost lpdlinux_rel1]$
```

Once the directory has been created, assign ownership to the directory using the "chown" command. Substitute <username> below with the user name of the account that was used to log into the workstation.

```
[cfdev@localhost lpdlinux rel1]$ sudo chown <username> /opt/logicpd
Password:
[cfdev@localhost lpdlinux_rel1]$
```

5.2   Building the Toolchain

With the files unpackaged and the necessary directories created, navigate to the toolchain directory and type "make toolchain". On most machines, the build will take at least 2-3 hours to complete.

```
[cfdev@localhost lpdlinux_rel1]$ cd LinuxTools
[cfdev@localhost LinuxTools]$ make toolchain
./check-toolchain-tools.sh || exit 1
                                       . . .
```

Please see Section 6 if the toolchain build fails.

5.3   Cleaning before Rebuilding the Toolchain

If the build is interrupted, clean out the partially built binaries by typing "make clean" before rebuilding.

```
[cfdev@localhost LinuxTools]$ make clean
rm -rf crosstool/build/m68k-linux/gcc-3.4.3-glibc-2.3.5/build-*
[cfdev@localhost LinuxTools]$ make toolchain
```

6   Building the Linux BSP and a Linux Image

With the toolchain installed and built, the next step is to build the Linux BSP. Navigate to the "LinuxBSP-22012005" directory and type "make fresh".

```
[cfdev@localhost lpdlinux_rel1]$ cd LinuxBSP-22012005
[cfdev@localhost LinuxBSP-22012005]$ make fresh
make -C linux-2.4.26 distclean
                                . . .
```

Next, a configuration file needs to be selected for the specific CDK that is to run the Linux image. The CDK configuration files are located in the "LinuxBSP-22012005/makedef/config" folder.

```
[cfdev@localhost LinuxBSP-22012005]$ ls defconfigs/config/
config-m5474gfe-evb-romfs    config-m5475ffe-evb-yaffs
config-m5474gfe-lite-romfs   config-m5484gfe-evb-romfs
config-m5475bfe-evb-romfs    config-m5484gfe-lite-romfs
config-m5475bfe-evb-yaffs    config-m5485afe-evb-romfs
config-m5475cfe-evb-romfs    config-m5485afe-lite-romfs
config-m5475cfe-evb-yaffs    config-m5485cfe-evb-romfs
config-m5475cfe-lite-romfs   config-m5485cfe-evb-yaffs
config-m5475cfe-lite-yaffs   config-m5485cfe-lite-romfs
config-m5475ffe-evb-romfs    config-m5485cfe-lite-yaffs
[cfdev@localhost LinuxBSP-22012005]$
```

Type "make" followed by the script name that matches the Fire Engine model number. The following example sets the build scripts to make a Linux image for the M5475-CFE Kits.

```
[cfdev@localhost LinuxBSP-22012005]$ make config-m5475cfe-evb-yaffs
make config-m5475cfe-evb-yaffs
                                . . .
```

Once the scripts have been configured, type "make dep" to build the dependencies.

```
[cfdev@localhost LinuxBSP-22012005]$ make dep
ake -C linux-2.4.26 dep
                                . . .
```

Finally, build the Linux image by typing "make".

```
[cfdev@localhost LinuxBSP-22012005]$ make
make[1]: Entering directory
                                . . .
```

The resulting Linux image will be placed in the "LinuxBSP-22012005/images" directory.

```
[cfdev@localhost LinuxBSP-22012005]$ ls images
image.bin  yaffs-rootfs.img  yaffs-rootfs-m5475cfe-evb.img
[cfdev@localhost LinuxBSP-22012005]$
```

If the image is configured for YAFFS, refer to the *Zoom™ CDK Linux Evaluation Guide* for instructions on how to load and execute the image on the kit. If the image is built in "romfs" format, refer to the "load" (to load the image into RAM) and "exec" (to execute the image) commands in the *LogicLoader Command Description Manual.* These documents can be downloaded from Logic's website: https://www.logicpd.com/auth/login.php.

7 Help and Support

Please note that the Linux software is being provided as reference software for Logic's board level products. Information on bugs or feature-additions should be posted to the Technical Discussion Group (referenced below) so that the community is aware of the findings.

Web-based support for Logic Product Development's Linux offerings and development kits can be obtained via the free online support tools (FAQ, documentation, Technical Discussion Group) described at http//www.logicpd.com/support. Developer-level support can be obtained by purchasing a support contract to gain direct access to an Applications Engineer familiar with the product. This section briefly describes both.

7.1 Web-based Support

The FAQ, related documentation and the Technical discussion group are different free online tools that can be used to get more information on the usage of the Linux BSP and toolchain.

The Technical Discussion Group is available at http://www.logicpd.com/support/tdg/ (scroll down to the "Linux" group), and provides a forum for developers to share information and to interact with others using the products – sometimes including Logic's development team members. To participate in the Technical Discussion Group, you must create an account. The Technical Discussion Group is provided for user discussion. While Logic Support Staff and Development Engineers participate, Logic does not guarantee the accuracy of information in the Technical Discussion Group.

7.2 Developer-level Support

Developer-level support is available for those customers needing direct access to an engineer familiar with Linux on the target hardware. Support contract pricing is available online at https://www.logicpd.com/support/order/ . Purchase a support contract to get an Applications Engineer to assist with:

- Troubleshooting any problems that occur while installing or building the Linux Toolchain or BSP.
- Designing a custom Linux build tailored to a product or embedded system.
- Developing custom drivers.

For more information about Support Contracts, visit the URL above, or contact Logic Sales by visiting http://www.logicpd.com/eps/sales.php