

BlueCat Linux Board Support Guide

BlueCat Linux Release 5.0

DOC-0611-00

for Accelent IDP PXA255 Boards

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Preface

For More Information

For more information on the features of BlueCat Linux, refer to the following printed and online documentation.

- *BlueCat Linux User's Guide*

This document contains information about installing, configuring and using BlueCat Linux.

- Online information

The complete BlueCat Linux documentation set is available on the BlueCat Linux Documentation CD-ROM. Books are provided in both HTML and PDF formats.

Updates to these documents are available online at the LynuxWorks Website: <http://www.lynuxworks.com>.

Additional information about commands and utilities is provided online with the `man` command. For example, to find information about the GNU GCC compiler, use the following syntax:

```
man gcc
```

Typographical Conventions

The typefaces used in this manual, summarized below, emphasize important concepts. All references to file names and commands are case sensitive and should be typed accurately.

Kind of Text

Examples

Body text; *italicized* for emphasis, new terms, and book titles

Refer to the *BlueCat Linux User's Guide*.

Environment variables, file names, functions, methods, options, parameter names, path names, commands, and computer data

```
ls
-l
myprog.c
/dev/null
```

Commands that need to be highlighted within body text, or commands that must be typed as is by the user are **bolded**.

```
login: myname
# cd /usr/home
```

Text that represents a variable, such as a file name or a value that must be entered by the user, is *italicized*.

```
cat <filename>
mv <file1> <file2>
```

Blocks of text that appear on the display screen after entering instructions or commands

```
Linux version 2.4.10-1
(bin@build1) (gcc version
2.95.3 20010315 (release)) #5
Tue Dec 18 13:33:08 MSK 2001
Processor: Intel StrongARM-
IXP1200 revision 3
Architecture: Intel IXP1200
On node 0 totalpages: 32768
zone(0): 32768 pages.
zone(1): 0 pages.
zone(2): 0 pages.
```

Keyboard options, button names, and menu sequences

Enter, **Ctrl-C**

Special Notes

The following notations highlight any key points and cautionary notes that may appear in this manual.

NOTE: These callouts note important or useful points in the text.



CAUTION! Used for situations that present minor hazards that may interfere with or threaten equipment/performance.

Technical Support

LynuxWorks Support handles support requests from current support subscribers.

For questions regarding LynuxWorks products or evaluation CDs, or to become a support subscriber, our knowledgeable sales staff will be pleased to help you (<http://www.lynuxworks.com/corporate/contact/sales.php3>).

How to Submit a Support Request

When you are ready to submit a support request, please include *all* the following information:

- First name
- Last name
- Your job title
- Phone number
- Fax number
- E-mail address
- Company name
- Address
- City, state, ZIP

- Country
- LynxOS or BlueCat Linux version you are using
- Target platform (for example, PowerPC or x86)
- Board Support Package (BSP)
- Current patch revision level
- Development host OS version
- Description of problem you are experiencing

Where to Submit a Support Request

By E-mail:

Support, Europe	tech_europe@lnxw.com
Support, worldwide except Europe	support@lnxw.com
Training and courses	USA: training-usa@lnxw.com Europe: training-europe@lnxw.com

By Phone:

Training and courses	USA: +1 408-979-4353 Europe: +33 1 30 85 06 00
Support, Europe (from our Paris, France office)	+33 1 30 85 93 96
Support, worldwide except Europe and Japan (from our San José, CA, USA headquarters)	+1 800-327-5969 or +1 408-979-3940
Support, Japan	+81 33 449 3131

By Fax:

Support, Europe (from our Paris, France office)	+33 1 30 85 06 06
Support, worldwide except Europe and Japan (from our San José, CA, USA headquarters)	+1 408-979-3945
Support, Japan	+81 22 449 3803

Web-based Support:

Log in at <http://www.linuxworks.com/support/custhelp.php3> for all support subscribers, including Europe.

The *BlueCat Linux Board Support Guide for Accelent IDP PXA255 Boards* provides information about the BlueCat Linux Board Support Package (BSP) for the Integrated Development Platform (IDP) PXA255 board from Accelent Systems Inc. (now Vibren Technologies Inc.).

The Accelent IDP PXA255 board provides the high performance and power efficiencies of the Intel PXA255 architecture in context of a feature rich, cost-effective development platform for embedded device application and product development, such as personal digital assistants (PDAs), wireless web pads, set-top boxes, Internet audio, and video devices.

Throughout this Board Support Guide (BSG), the BSP is referred to as the “idp_pxa255.”

Features Overview

The following sections describe the new features of this release.

Kernel Version

BlueCat Linux release 5.0 is based on the Linux kernel version 2.6.0 available from www.kernel.org.

BlueCat Linux Cross-Development Tools

BlueCat Linux release 5.0 supports the following versions of GNU toolchain:

- `gcc` version 3.2.2
- `binutils` version 2.13.1

Supported Hardware

Table 1-1 describes the hardware supported with this release. For available BlueCat Linux drivers, please see Chapter 5, “Supported Device Drivers.”

Table 1-1: Hardware Supported

Model	Description
Accelent IDP PXA255 Board	<ul style="list-style-type: none">• Intel PXA255 applications processor• Little-endian• 64 MB SDRAM• 32 MB StrataFlash• Via Secure Digital (SD) connector• Three configurable serial ports at 230.4 Kbps• One full handshake port and two partial implementations• 10/100 Base-T (SMSC LAN91C111) Ethernet• Interrupt controller• LEDs• On-chip master and slave I²C bus interfaces

Available BlueCat Linux Development Tools

Table 1-2 indicates the availability of BlueCat Linux development tools on the cross-development platforms listed for use with the idp_pxa255 BSP.

Table 1-2: BlueCat Linux Tools Availability

Tool	Windows	Linux
CodeWarrior	N/A	N/A
SpyKer	N/A	N/A
VisualLynux	✓	N/A

Supported Cross-Development Hosts

The BlueCat Linux development environment requires an installed, functional cross-development host with an Intel 386 or higher CPU. This host needs to be running one of the following development environments:

- Windows 2000/Pro with SP1 or later
- Windows XP
- PC running Red Hat Linux 8.0
- PC running Red Hat Linux 9.0

Downloading and Booting BlueCat Linux on the Target

This chapter provides instructions for downloading a BlueCat Linux demo system from a cross-development host onto the target and then booting the demo system on the target board.

Prerequisites

This document is a guide to downloading and booting BlueCat Linux systems onto the user's target platform. Scenarios that use demo systems included in the BlueCat Linux distribution are presented. A basic familiarity with the target platform hardware and operation is required. The user must also have an understanding of system administration for the particular cross-development host on which the BlueCat Linux Core and the BSP are installed. It is assumed that the user has the manufacturer's documentation for the target board as well as system administration reference material for the cross-development host.

Before downloading and booting BlueCat Linux on the target board, it is assumed that the default BlueCat Linux Accelent IDP PXA255 configuration and the `idp_pxa255` BSP have been installed on the development host. This means that the user must:

1. Install the BlueCat Linux XScale Core onto the cross-development host as described in the “Installing the Default Configuration” section in Chapter 1, “Introduction and Installation” in the *BlueCat Linux User's Guide*.
2. Install the `idp_pxa255` BSP onto the cross-development host as detailed in the “Installing Target Board Support” section of Chapter 1, “Introduction and Installation” in the *BlueCat Linux User's Guide*.
3. Activate support for the `idp_pxa255` BSP as detailed in the “Activating Support for a Target Board” section of Chapter 1, “Introduction and Installation” in the *BlueCat Linux User's Guide*.

Downloading and Booting Overview

The procedure for downloading and booting a BlueCat Linux system onto an Accelent IDP PXA255 target consists of the following main steps:

- Setting up hardware
- Booting a BlueCat Linux embedded system from target Flash memory or a network

Downloading and booting a BlueCat Linux system from a network can be performed using either:

- LynuxWorks Boot Loader
- or:
- BlueCat Linux OS loader

The LynuxWorks Boot Loader is a firmware intended to act as a boot loader for BlueCat Linux and LynxOS. Boot Loader is able to load BlueCat Linux embedded systems from Flash or over a network and to program them to Flash.

The BlueCat Linux OS loader demo system includes the `i_osloader` and `osloader` Kernel Downloadable Images (KDIs). `osloader` is the image with the base functionality of the BlueCat Linux OS loader configured in. This includes the ability to download BlueCat Linux images from a TFTP host, execute them in RAM, and other important features. `i_osloader` is extended with support for the Journalling Flash File System (JFFS) and can thus be used to download a desired BlueCat Linux custom or demo system into the target board's Flash memory.

Please refer to Chapter 3, “Downloading and Booting BlueCat Linux” in the *BlueCat Linux User's Guide* for a discussion of the BlueCat Linux OS loader.

Setting up Hardware

Configuring the On-Board Switches and Jumpers

Prior to using the board, the following on-board switches and jumpers need to be configured:

Table 2-1: On-Board Switches and Jumpers Configuration

Switch/Jumper	Setting	Description
SW5.1	Off	Normal Boot Loader mode.
SW5.2	Off	Normal Boot Loader mode.
J18, J19, J21, J22	2-3	Serial port with RTS and CTS. DE-9P connector J16.
J47, J48	2-3	DE-9P connector J46.
J12 Pin: 1-2 Pin: 3-4 Pin: 5-6 Pin: 7-8 Pin: 9-10 Pin: 11-12 Pin: 13-14 Pin: 15-16 Pin: 17-18 Pin 19-20	Shunted Shunted Shunted Shunted Shunted Shunted Shunted Shunted Shunted Shunted	Enable FF_RTS signal. Enable FF_CTS. Enable FF_DTR. Enable FF_DSR. Enable FF_RI. Enable FF_DCD. Enable BT_RTS. Enable BT_CTS. Enable IR_TXD. Enable IR_RXD.
J77, J78	1-2	Assign StrataFlash Flash memory to BCS0 and assign M-system Flash memory to BCS1.
J9, J10, J11	1-2 1-2 1-2	32-bit asynchronous Flash memory. On-board StrataFlash.

Power on the board by setting the switch SW1 to the ON position.

Refer to *Integrated Development Platform for Intel XScale Application Processor Hardware Technical Reference, PCB-0017-1005* for more information about the configuration of switches and jumpers.

Connecting the Target Board Serial Ports to the Host

The target board has three serial ports arranged in a single stack. The port names are J5, J16, and J46. The J5 serial port is used both by the LynuxWorks Boot Loader and the BlueCat Linux system console.

Before using the board, at least the first serial port needs to be connected to the development host. It is recommended that the user connect the target serial connector to COM1 on the host.

The serial port settings on the host must be as follows:

- The serial port connected to the J5 target serial port has a baud rate of 115200.
- The serial ports connected to either the J16 or J46 target serial port can have any baud rate.

Throughout this chapter, the terminal window connected to the J5 serial connector is referred to as the “Boot Loader console” or the “BlueCat Linux console,” depending on the context.

Connecting the Target Board Ethernet Card to the Host

The Accelent IDP PXA255 board provides 10BaseT and 100BaseTX Ethernet connections via Category 5 Unshielded Twisted Pair cable using the on-board RJ-45 connector, which is referenced as J70 in the manufacture’s documentation.

The Ethernet port on the target board is used to provide a standard network connection for the board and, in particular, to load BlueCat Linux embedded systems onto the board over a network. The Ethernet port on the Accelent IDP PXA255 board is used to connect to a LAN.

It is also required that the user set up networking on the host system. In particular, the user must choose a unique IP address for the development host as well as for the target board. These addresses are referred to as `<development_host_IP>` and `<target_board_IP>`, respectively. For more information on how to set up networking on the host, please refer to system administration reference material.

TFTP must be enabled on the host. For more information, refer to “Setting Up a TFTP Server” in Chapter 3, “Downloading and Booting BlueCat Linux” in the *BlueCat Linux User's Guide*.

Installing LynuxWorks Boot Loader into Flash

To install the LynuxWorks Boot Loader into Flash on the Accelent IDP PXA255 board, the following software and hardware components are required:

- The source file for building the `bin2boot` utility provided in the Appendix A of this document
- The PCMCIA or CompactFlash ATA card with a CompactFlash card adapter
- The card reader for the host computer or the PCMCIA slot in the host computer

To burn the LynuxWorks Boot Loader into Flash, perform the following steps:

1. On the development host, execute the following command to build the `bin2boot` utility using the source provided in the Appendix A:

```
bash$ gcc -o bin2boot bin2boot.c
```

NOTE: This command must be executed prior to setting the BlueCat Linux environment.

2. Copy the `bin2boot` utility built at Step 1 into the `<BlueCat_Linux_installation_path>/boot` directory in which the Boot Loader image `idp_pxa255.bin` is located, where `<BlueCat_Linux_installation_path>` is the path to the BlueCat Linux environment.
3. Use the `bin2boot` utility to create the `boot.bin` file:

```
bash$ cd <BlueCat_Linux_installation_path>/boot
bash$ ./bin2boot idp_pxa255.bin
```

```
Opening image file idp_pxa255.bin
```

```
File Length  0x80000
Checksum     0x73bab8
```

```
Writing boot.bin image file.. Done.
bash$
```

4. Connect the PCMCIA or CompactFlash ATA card to the development host and format the card as a FAT file system.
5. Copy the `boot.bin` file to the card.

6. Turn off the SW1 power switch on the Accelent IDP PXA255 board and then insert the card into the PC card slot J30 on the target board.
7. Turn on the SW1 power switch on the Accelent IDP PXA255 board.
After the Boot Loader file has been loaded, a screen message on the console indicates that programming is complete.
8. Turn off the SW1 power switch and remove the card.
9. Turn on the SW1 power switch on the target board.

The LynuxWorks Boot Loader is started and prints the following message on the serial console (J5):

```
BootLoader v2.0. Copyright 2002 LynuxWorks, Inc. All rights reserved.  
Secondary Bootloader module started from 0x00040000  
RAM: 64Mb (0xa0000000 - 0xa4000000)  
SBM: 77Kb (0xa0000000 - 0xa00134dc)  
Malloc pool: 434Kb (0xa00134dc - 0xa0080000)  
Free memory: 63Mb (0xa0080000 - 0xa4000000)  
idp_pxa255>
```

Setting Up the LynuxWorks Boot Loader Firmware

To set up the LynuxWorks Boot Loader firmware for BlueCat Linux operations, perform the following steps:

1. Reset the target board.
2. At the LynuxWorks Boot Loader console, enter the following commands:

```
idp_pxa255> set autoboot 0  
idp_pxa255> set boot_tftp_host_ip \  
<development_host_IP>  
idp_pxa255> set boot_tftp_client_ip \  
<target_board_IP>  
idp_pxa255> set flash_tftp_host_ip \  
<development_host_IP>  
idp_pxa255> set flash_tftp_client_ip \  
<target_board_IP>  
idp_pxa255> save
```

where *<target_board_IP>* is the IP address of the target and
<development_host_IP> is the IP address of the development host.

3. Reset the target board.

Downloading a BlueCat Linux System into Flash

This section provides instructions on how a BlueCat Linux embedded system can be downloaded into the target Flash memory using the LynuxWorks Boot Loader firmware.

Downloading a BlueCat Linux System into Flash Using LynuxWorks Boot Loader

To download the `showcase` demo system into the Flash of the target board using the LynuxWorks Boot Loader, perform the following steps:

1. Copy the `showcase.kdi` file from the `$BLUECAT_PREFIX/demo/showcase` directory to the `/tftpboot` directory on the development host.
2. Reset the target board.
3. At the LynuxWorks Boot Loader console, enter the following commands:

```
idp_pxa255> set flash_device tftp
idp_pxa255> set flash_tftp_file showcase.kdi
idp_pxa255> set flash_target flash0
idp_pxa255> set flash_offset 0x100000
idp_pxa255> flash
```

After these commands have been performed, the `showcase` demo system is programmed into Flash and can be booted as described in “Booting a BlueCat Linux System from Flash” on page 11.

Booting a BlueCat Linux System from Flash

Booting a BlueCat Linux System from Flash Using the LynuxWorks Boot Loader

To boot a demo installed into the Flash memory, perform the steps listed below. For detailed information on how to install the demo system to Flash, refer to “Downloading a BlueCat Linux System into Flash Using LynuxWorks Boot Loader” on page 11.

1. Reset the target board.

2. At the LynuxWorks Boot Loader console, enter the following commands:

```
idp_pxa255> set boot_device flash0
idp_pxa255> set boot_flash_offset 0x100000
idp_pxa255> set boot_os BlueCat
idp_pxa255> boot
```

These commands will start the demo system programmed into Flash at offset 0x100000.

The Accelent IDP PXA255 board can be configured to start a demo system programmed into Flash automatically at the board power-up. To prepare the Accelent IDP PXA255 board to boot BlueCat Linux from Flash automatically, enter the following commands:

```
idp_pxa255> set boot_device flash0
idp_pxa255> set boot_flash_offset 0x100000
idp_pxa255> set boot_os BlueCat
idp_pxa255> set autoboot 1
idp_pxa255> save
```

As a result, the demo system programmed into Flash is started by the LynuxWorks Boot Loader automatically on board power-up.

Booting a BlueCat Linux System from a Network

A BlueCat Linux demo system can be booted from a network using either the LynuxWorks Boot Loader or BlueCat Linux OS loader.

Booting a BlueCat Linux System from a Network Using the LynuxWorks Boot Loader

To boot the `showcase` demo system over a network using the LynuxWorks Boot Loader firmware, perform the following steps:

1. Copy the `showcase.kdi` file from the `$BLUECAT_PREFIX/demo/showcase` directory to the `/tftpboot` directory on the cross-development host.
2. Reset the target board.
3. At the LynuxWorks Boot Loader console, enter the following commands:

```
idp_pxa255> set boot_device tftp
idp_pxa255> set boot_os BlueCat
```

```
idp_pxa255> set boot_tftp_file showcase.kdi
idp_pxa255> boot
```

These commands load the `showcase` demo system from a network onto the target board and then automatically start it.

Booting a BlueCat Linux System from a Network Using the OS Loader

To boot the `showcase` demo system over a network using the OS loader, perform the following steps:

1. Copy the `osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the development host.
2. Copy the `showcase.kernel` and `showcase.rfs` files from the `$BLUECAT_PREFIX/demo/showcase` directory to the `/tftpboot` directory on the cross-development host.
3. Reset the target board.
4. At the LynuxWorks Boot Loader console, enter the following commands:

```
idp_pxa255> set boot_device tftp
idp_pxa255> set boot_tftp_file osloader.kdi
idp_pxa255> set boot_os BlueCat
idp_pxa255> boot
```

These commands start the `osloader` demo system from RAM. As a result, the BlueCat Linux OS loader prompt appears in the BlueCat Linux console.

5. At the BlueCat Linux OS loader prompt, enter the following commands:

```
> set IF eth0
> set IP <target_board_IP>
> set HOST <development_host_IP>
> set KERNEL tftp showcase.kernel
> set RFS tftp showcase.rfs
> set CMD ramdisk_size=32000
> boot
```

where `<target_board_IP>` is the IP address of the target and `<development_host_IP>` is the IP address of the development host.

These commands load the `showcase` demo system from a network onto the target board and then automatically start it.

Kernel Configuration Options

The idp_pxa255 BSP comes with a default BlueCat Linux kernel. This kernel has a number of configuration options. This chapter details these options in the tables listed in Table 3-1: “BlueCat Linux Default Configuration for the idp_pxa255 BSP Distribution” below. Boldfaced entries in the tables represent subordinate menus. Italicized entries represent comments.

Table 3-1: BlueCat Linux Default Configuration for the idp_pxa255 BSP Distribution

Table Number and Configuration Parameter
Table 3-2: “Code Maturity Level Options”
Table 3-3: “General Setup”
Table 3-4: “Loadable Module Support”
Table 3-5: “System Type”
Table 3-6: “Architecture-dependent General Setup”
Table 3-7: “Parallel Port Support”
Table 3-8: “Memory Technology Devices”
Table 3-9: “Plug and Play Support”
Table 3-10: “Block Devices”
Table 3-11: “Multidevice Support (RAID and LVM)”
Table 3-12: “Networking Support”
Table 3-13: “ATA/ATAPI/MFM/RLL Support”
Table 3-14: “SCSI Device Support”
Table 3-15: “ISDN Subsystem”
Table 3-16: “Input Device Support”

Table 3-1: BlueCat Linux Default Configuration for the idp_pxa255 BSP Distribution (Continued)

Table Number and Configuration Parameter
Table 3-17: "Character Devices"
Table 3-18: "Multimedia Devices"
Table 3-19: "File Systems"
Table 3-20: "Graphics Support"
Table 3-21: "USB Support"
Table 3-22: "MMC/SD Card Support"
Table 3-23: "Kernel Hacking"
Table 3-24: "Security Options"
Table 3-25: "Cryptographic Options"

Table 3-2: Code Maturity Level Options

Description	Setting
Prompt for development and/or incomplete code/drivers	Y
Select only drivers expected to compile cleanly	Y
Select only drivers that don't need compile-time external firmware	Y

Table 3-3: General Setup

Description	Setting
Support for paging of anonymous memory	Y
System V IPC	Y
BlueCat Linux OS loader support	is not set
BlueCat Linux ignore printk	is not set
Memory sizing benchmarks	is not set
BSD Process Accounting	is not set

Table 3-3: General Setup (Continued)

Description	Setting
Sysctl support	Y
Kernel .config support	is not set
Remove Kernel Features (for Embedded Systems)	
Load all symbols for debugging/kksymoops	Y
Enable futex support	Y
Enable eventpoll support	Y
No-op I/O scheduler	Y
Anticipatory I/O scheduler	Y
Deadline I/O scheduler	Y
CODETEST Device Driver Configuration	is not set

Table 3-4: Loadable Module Support

Description	Setting
Enable loadable module support	Y
Module unloading	Y
Forced module unloading	is not set
Module versioning support (Experimental)	Y
Automatic kernel module loading	Y

Table 3-5: System Type

Description	Setting
ARM System Type (PXA250/210-based)	
ADIFCC-based	is not set
Anakin	is not set

Table 3-5: System Type (Continued)

Description	Setting
Cirrus-CL-PS7500FE	is not set
CLPS711x/EP721x-based	is not set
Co-EBSA285	is not set
PXA250/210-based	Y
EBSA-110	is not set
Epxa10db	is not set
FootBridge	is not set
Integrator	is not set
IOP3xx-based	is not set
LinkUp-L7200	is not set
RiscPC	is not set
SA1100-based	is not set
Shark	is not set
ColoradoSprings	is not set
CLPS711X/EP721X Implementations	is not set
Epxa10db	is not set
Footbridge Implementations	is not set
IOP3xx Implementation Options	
<i>--- IOP3xx Platform Types</i>	
Enable support for IQ80310	is not set
Enable support for IQ80321	is not set
Enable support for IQ31244	is not set
Enable support for IQ80331	is not set
Intel PXA250/210 Implementations	
Intel DBPXA250 Development Platform	is not set
Accelent XScale ID	Y

Table 3-5: System Type (Continued)

Description	Setting
SA11x0 Implementations	is not set
<i>--- Processor Type</i>	
<i>--- Processor Features</i>	
Support Thumb user binaries	is not set
Support for BDI2000 JTAG Debugger	is not set
Enable dcache write allocate on XScale	Y

Table 3-6: Architecture-dependent General Setup

Description	Setting
Compressed boot loader in ROM/Flash	is not set
Compressed ROM boot loader base address	0x0
Compressed ROM boot loader BSS address	0x0
Support for hot-pluggable devices	is not set
<i>--- At least one math emulation must be selected</i>	
NWFPE math emulation	Y
Support extended precision	is not set
FastFPE math emulation (Experimental)	is not set
Kernel support for ELF binaries	Y
Kernel support for <code>a.out</code> and ECOFF binaries	is not set
Kernel support for MISC binaries	is not set
Generic Driver Options	is not set
Power Management support	is not set
Preemptible Kernel (Experimental)	Y
RISC OS personality	is not set

Table 3-6: Architecture-dependent General Setup (Continued)

Description	Setting
Default kernel command string	is not set
Timer and CPU usage LEDs	is not set

Table 3-7: Parallel Port Support

Description	Settings
Parallel port support	is not set

Table 3-8: Memory Technology Devices

Description	Settings
Memory Technology Device (MTD) support	Y
Debugging	is not set
MTD partitioning support	Y
MTD concatenating support	is not set
RedBoot partition table parsing	is not set
Command line partition table parsing	is not set
ARM Firmware Suite partition parsing	is not set
<i>--- User Modules and Translation Layers</i>	
Direct character device access to MTD devices	Y
Caching block device access to MTD devices	Y
Flash Translation Layer (FTL) support	is not set
NAND Flash Translation Layer (NFTL) support	is not set
Inverse NAND Flash Translation Layer (INFTL) support	is not set
RAM/ROM/Flash Chip Drivers	
Detect Flash chips by Common Flash Interface (CFI) probe	Y

Table 3-8: Memory Technology Devices (Continued)

Description	Settings
Detect non-CFI AMD/JEDEC-compatible Flash chips	is not set
Flash chip driver advanced configuration options	is not set
Support for Intel/Sharp Flash chips	Y
Support for AMD/Fujitsu Flash chips	is not set
Support for ST (Advanced Architecture) Flash chips	is not set
Support for RAM chips in bus mapping	is not set
Support for ROM chips in bus mapping	is not set
Support for absent chips in bus mapping	is not set
Older (theoretically obsoleted now) drivers for non-CFI chips	is not set
Mapping Drivers for Chip Access	
Support for nonlinear mappings of Flash chips	is not set
CFI Flash device in physical memory map	is not set
CFI Flash device mapped on ARM Integrator/P720T	is not set
CFI Flash device mapped on the Accelent IDP board	Y
CFI Flash device mapped on EDB7312	is not set
Self-contained MTD Device Drivers	
Uncached system RAM	is not set
Test driver using RAM	is not set
MTD emulation using block device	is not set
<i>--- Disk-On-Chip Device Drivers</i>	
M-Systems Disk-On-Chip 2000 and Millennium	is not set
M-Systems Disk-On-Chip Millennium-only alternative driver (see help)	is not set
M-Systems Disk-On-Chip Millennium Plus	is not set
NAND Flash Device Drivers	
NAND device support	is not set

Table 3-9: Plug and Play Support

Description	Settings
Plug and Play support	is not set

Table 3-10: Block Devices

Description	Settings
Normal floppy disk support	is not set
Loopback device support	is not set
Network block device support	is not set
RAM disk support	Y
Default RAM disk size	4096
Initial RAM disk (<code>initrd</code>) support	is not set
BlueCat Linux RFS support	Y

Table 3-11: Multidevice Support (RAID and LVM)

Description	Settings
Multiple devices driver support (RAID and LVM)	is not set

Table 3-12: Networking Support

Description	Settings
Networking support	Y
Networking Options	
Packet socket	is not set
Netlink device emulation	is not set

Table 3-12: Networking Support (Continued)

Description	Settings
UNIX domain sockets	Y
PF_KEY sockets	is not set
TCP/IP networking	Y
IP: multicasting	is not set
IP: advanced router	is not set
IP: kernel level autoconfiguration	is not set
IP: tunneling	is not set
IP: GRE tunnels over IP	is not set
IP: ARP daemon support (Experimental)	is not set
IP: TCP Explicit Congestion Notification support	is not set
IP: TCP syncookie support (disabled per default)	is not set
IP: AH transformation	is not set
IP: ESP transformation	is not set
IP: IPComp transformation	is not set
The IPv6 protocol (Experimental)	is not set
DECnet support	is not set
802.1d Ethernet Bridging	is not set
Network Packet Filtering (replaces ipchains)	is not set
SCTP Configuration (Experimental)	
The SCTP protocol (Experimental)	is not set
Asynchronous Transfer Mode (ATM) (Experimental)	is not set
802.1Q VLAN support	is not set
ANSI/IEEE 802.2 LLC type 2 support	is not set
The IPX protocol	is not set
Appletalk protocol support	is not set
CCITT X.25 Packet Layer (Experimental)	is not set
LAPB Data Link Driver (Experimental)	is not set

Table 3-12: Networking Support (Continued)

Description	Settings
Frame Diverter (Experimental)	is not set
Acorn Econet/AUN protocols (Experimental)	is not set
WAN router	is not set
Fast switching (read help!)	is not set
Forwarding between high speed interfaces	is not set
QoS and/or Fair Queueing	
QoS and/or fair queueing	is not set
Network Testing	
Packet Generator (Use with Caution)	is not set
Network device support	Y
Dummy net driver support	is not set
Bonding driver support	is not set
EQL (serial line load balancing) support	is not set
Universal TUN/TAP device driver support	is not set
Ethernet (10 or 100Mbit)	
Ethernet (10 or 100Mbit)	Y
--- <i>Generic Media Independent Interface device support</i>	
SMC 91C9x/91C1xxx support	Y
Ethernet (1000 Mbit)	is not set
Ethernet (10000 Mbit)	is not set
IBM On-chip Net Device	
Point-to-Point Protocol (PPP) support	is not set
Serial Line Internet Protocol (SLIP) support	is not set
Wireless LAN (Non-Ham Radio)	
Wireless LAN drivers (non-ham radio) and wireless extensions	is not set

Table 3-12: Networking Support (Continued)

Description	Settings
Token Ring Devices	is not set
Traffic Shaper (Experimental)	is not set
WAN Interfaces	
WAN interfaces support	is not set
Amateur Radio Support	
Amateur radio support	is not set
IrDA (infrared) Support	
IrDA subsystem support	is not set
Bluetooth Support	
Bluetooth subsystem support	is not set

Table 3-13: ATA/ATAPI/MFM/RLL Support

Description	Settings
ATA/ATAPI/MFM/RLL support	is not set

Table 3-14: SCSI Device Support

Description	Settings
SCSI device support	is not set

Table 3-15: ISDN Subsystem

Description	Settings
ISDN support	is not set

Table 3-16: Input Device Support

Description	Settings
Input devices (needed for keyboard, mouse, ...)	is not set
<i>---Userland interfaces</i>	
<i>--- Input I/O Drivers</i>	
Gameport support	is not set
Serial I/O support	is not set
i8042 PC keyboard controller	is not set
<i>--- Input Device Drivers</i>	

Table 3-17: Character Devices

Description	Settings
Virtual terminal	is not set
Nonstandard serial port support	is not set
Serial Drivers	
8250/16550 and compatible serial support	is not set
<i>--- Non-8250 serial port support</i>	
PXA serial port support	Y
Console on PXA serial port	Y
Unix98 PTY support	Y
Maximum number of Unix98 PTYs in use (0 to 2048)	256
I²C Support	
I ² C support	Y
I ² C device interface	is not set
Intel 80321 I ² C algorithm	is not set
I²C Algorithms	

Table 3-17: Character Devices (Continued)

Description	Settings
I ² C bit-banging interfaces	is not set
I ² C PCF 8584 interfaces	is not set
I²C Hardware Bus support	
AMD 756/766	is not set
AMD 8111	is not set
I ² C interface in Intel PXA2xx	Y
I²C Hardware Sensors Chip support	
Analog Devices ADM1021 and compatibles	is not set
EEPROM (DIMM) reader	is not set
ITE IT87xx and compatibles	is not set
National Semiconductor LM75 and compatibles	is not set
National Semiconductor LM78 and compatibles	is not set
National Semiconductor LM85 and compatibles	is not set
VIA686A	is not set
Winbond W83781D, W83782D, W83783S, W83627HF, Asus AS99127F	is not set
Mice	
Bus mouse support	is not set
QIC-02 tape support	is not set
IPMI	
IPMI top-level message handler	is not set
Watchdog Cards	
Watchdog timer support	is not set
/dev/nvram support	is not set
Enhanced Real Time Clock support	is not set
Generic /dev/rtc emulation	is not set

Table 3-17: Character Devices (Continued)

Description	Settings
Double Talk PC internal speech card support	is not set
Siemens R3964 line discipline	is not set
Applicom intelligent fieldbus card support	is not set
Ftape, the Floppy Tape Device driver	
Ftape (QIC-80/Travan) support	is not set
/dev/agpgart (AGP support)	is not set
Direct Rendering Manager (XFree86 4.1.0 and higher DRI support)	is not set
RAW driver (/dev/raw/rawN)	is not set

Table 3-18: Multimedia Devices

Description	Settings
Video for Linux	is not set
Digital Video Broadcasting Devices	
DVB for Linux	is not set

Table 3-19: File Systems

Description	Setting
Second extended file system support	Y
Ext2 extended attributes	is not set
Ext3 journalling file system support	is not set
Reiserfs support	is not set
JFS file system support	is not set
XFS file system support	is not set
Minix file system support	is not set

Table 3-19: File Systems (Continued)

Description	Setting
ROM file system support	is not set
Quota support	is not set
Kernel automounter support	is not set
Kernel automounter version 4 support (also supports v3)	is not set
CD-ROM/DVD File Systems	
ISO 9660 CD-ROM file system support	is not set
UDF file system support	is not set
DOS/FAT/NT File Systems	
DOS FAT file system support	is not set
NTFS file system support	is not set
Pseudo File Systems	
/proc file system support	Y
/dev file system support (Obsolete)	is not set
/dev/pts file system for Unix98 PTYs	Y
/dev/pts Extended Attributes	is not set
Virtual memory file system support (former shm file system)	is not set
Miscellaneous File Systems	
ADFS file system support (Experimental)	is not set
Amiga FFS file system support (Experimental)	is not set
Apple Macintosh file system support (Experimental)	is not set
BeOS file system (BeFS) support (read-only) (Experimental)	is not set
BFS file system support (Experimental)	is not set
EFS file system support (read-only) (Experimental)	is not set
Compressed ROM file system support	is not set
FreeVxFS file system support (VERITAS VxFS™-compatible)	is not set
OS/2 HPFS file system support	is not set

Table 3-19: File Systems (Continued)

Description	Setting
QNX4 file system support (read-only)	is not set
System V/Xenix/V7/Coherent file system support	is not set
UFS file system support (read-only)	is not set
Network File Systems	
NFS file system support	is not set
NFS server support	is not set
SMB file system support (to mount Windows shares, etc.)	is not set
CIFS support (advanced network file system for Samba, Windows, and other CIFS-compliant servers)	is not set
NCP file system support (to mount NetWare volumes)	is not set
Coda file system support (advanced network file system)	is not set
InterMezzo file system support (replicating file system) (Experimental)	is not set
Andrew File System (AFS) support (Experimental)	is not set
Partition Types	
Advanced partition selection	is not set

Table 3-20: Graphics Support

Description	Settings
Support for frame buffer devices	is not set

Table 3-21: USB Support

Description	Setting
Support for USB Gadgets	is not set

Table 3-22: MMC/SD Card Support

Description	Setting
MMC support	Y
MMC debugging	is not set
MMC block device driver	Y
Intel PXA255 Multimedia Card Interface support	Y

Table 3-23: Kernel Hacking

Description	Setting
Include Frame Pointer	Y
Verbose user fault messages	is not set
Include GDB debugging information in kernel binary	is not set
Kernel debugging	is not set
BlueCat Linux kernel debugger	is not set

Table 3-24: Security Options

Description	Setting
Enable different security model	is not set

Table 3-25: Cryptographic Options

Description	Setting
Cryptographic API	is not set

This chapter provides information about BlueCat Linux demo systems supported by the `idp_pxa255` BSP.

Demo Systems

Table 4-1 lists the demo systems supported in the `idp_pxa255` BSP distribution, the boot devices supported by each demo system, and their respective RAM and ROM requirements.

Table 4-1: Demo Systems Supported by the `idp_pxa255` BSP

Demo	Boot Devices Supported by Default	ROM Requirements	RAM Requirements
<code>developer</code>	Flash (using the LynuxWorks Boot Loader or OS loader) Network (using the LynuxWorks Boot Loader or OS loader)	4765.5 KB	21918 KB
<code>osloader</code>	Flash (using the LynuxWorks Boot Loader) Network (using the LynuxWorks Boot Loader)	1008.5 KB	4665 KB
<code>showcase</code>	Flash (using the LynuxWorks Boot Loader or OS loader) Network (using the LynuxWorks Boot Loader or OS loader)	3617.5 KB	14008 KB

developer Demo System

The `developer` demo system is a package consisting of the functionalities of the `shell`, `ftp`, `ping`, `gdb`, and `vl_demo` systems. For descriptions of

`developer` and its components, refer to Chapter 4, “BlueCat Linux Demo Systems” in the *BlueCat Linux User’s Guide*.

osloader Demo System

`osloader` is the BlueCat Linux OS loader used to boot a BlueCat Linux system on the target board. Refer to Chapter 4, “BlueCat Linux Demo Systems” in the *BlueCat Linux User’s Guide* for details.

showcase Demo System

The `showcase` demo system starts and configures the Apache HTTP daemon, turning the target board into a web server. Refer to Chapter 4, “BlueCat Linux Demo Systems” in the *BlueCat Linux User’s Guide* for details.

Adding I²C support to a BlueCat Linux Demo System

This section illustrates how I²C support can be added to a BlueCat Linux demo system. The `developer` demo is used as an example of a BlueCat Linux demo system.

To add I²C support to a BlueCat Linux 5.0 demo system, perform the following steps:

1. Activate the BlueCat Linux installation:

```
bash$ . SETUP.sh idp_pxa255
```

2. Change to the `developer` demo directory:

```
BlueCat:~$ cd $BLUECAT_PREFIX/demo/developer
```

3. Enable I²C support in the kernel configuration file for the `developer` demo system. To change the kernel configuration, use either the `make menuconfig` or `make xconfig` command. The following kernel configuration options from the **Character Device** menu must be enabled (set to **Y**):

- **I2C support->I2C support**
- **I2C support->I2C hardware bus support->I2C interface in Intel PXA2xx**

4. Rebuild the demo system:

```
BlueCat:~$ make clean  
BlueCat:~$ make all
```

5. Boot the resulting `developer` demo KDI on the target board as described in Chapter 2, “Downloading and Booting BlueCat Linux on the Target.”

While kernel bootstrapping, the following line appears on the system console:

```
i2c_adapter i2c-0: found device 0x4b
```

NOTE: Please note that there are no I²C devices on the IDP PXA255 board.

NOTE: BlueCat Linux provides an interface allowing user-space programs to use the I²C bus. For this purpose, an `i2c-0` device node file should be created in the `/dev` directory in the target root file system either by using the `mknod /dev/i2c-0 c 89 0` command on the target at run-time or by adding the command to the `mkrootfs` spec file. The kernel must be configured with the **Character devices->I2C support->I2C device interface** option enabled.

Adding MMC Support to a BlueCat Linux Demo System

This section illustrates how a BlueCat Linux demo system can be booted onto the target using the MultiMedia Card (MMC). The `showcase` demo is used as an example of a BlueCat Linux demo system.

To add MMC support to a BlueCat Linux 5.0 demo system, perform the following steps:

1. Set up the BlueCat Linux environment:

```
bash$ . SETUP.sh idp_pxa255
```

2. Change to the `showcase` demo directory:

```
BlueCat:~$ cd $BLUECAT_PREFIX/demo/showcase
```

3. Enable MMC support in the kernel configuration file for the `showcase` demo system. To change the kernel configuration, use either the `make menuconfig` or `make xconfig` command. The following kernel configuration options from the **MMC/SD Card Support** menu must be enabled (set to **Y**):

- **MMC support**
- **MMC block device driver**
- **Intel PXA255 Multimedia Card Interface support**

4. Rebuild the demo system:

```
BlueCat:~# bash$ make clean
BlueCat:~# bash$ make all
```

5. Execute the following command to build the `showcase.kdi` image composed of a compressed kernel image, but not including a compressed file system. Instead, specify the device node of the target MMC partition onto which the root file system is to be downloaded.

```
BlueCat:~# bash$ mkboot -m -k showcase.kernel -r 1300 \
showcase.kdi
```

6. Copy the `showcase.kdi` and `showcase.tar` files built in the previous step to the TFTP host.
7. Insert the MMC card into the slot on the target board.
8. Check that the MMC card support is enabled in the kernel configuration file for the `i_osloader` demo system. The following kernel configuration options from the **MMC/SD Card Support** menu must be enabled (set to **Y**):

- **MMC support**
- **MMC block device driver**
- **Intel PXA255 Multimedia Card Interface support**

9. Copy the `i_osloader` demo KDI to the TFTP host and boot it onto the target board:

```
idp_pxa255> set boot_device tftp
idp_pxa255> set boot_tftp_file i_osloader.kdi
idp_pxa255> boot
```

10. At the BlueCat Linux OS loader prompt, set up the OS loader environment variables on the target:

```
> set IF eth0
> set IP 172.17.3.7
> set HOST 172.17.0.1
> set FILE tftp showcase.tar
```

11. Create the file system on the card by performing the following command on the system console:

```
> exec mke2fs /dev/mmcblk0
```

12. Mount the file system on the MMC card by performing the following command on the system console:

```
> mount /dev/mmcblk0 /mnt
```

13. Load the `showcase.tar` file from the TFTP host onto the MMC card and unmount the MMC card file system. Please note that the `umount` operation for the MMC card takes a considerable time to complete.

```
> cd /mnt
> ntar
> cd /
> umount /mnt
>
```

14. Reset the target board by switching the power off, then on.
15. At the Boot Loader prompt, run the following commands to boot the `showcase demo` onto the target:

```
idp_pxa255> set boot_device tftp
idp_pxa255> set boot_tftp_file showcase.kdi
idp_pxa255> boot
```

These commands boot the `showcase demo` onto the target and mount the root file system on the MMC card. The `showcase demo` starts automatically.

Adding DHCP Support to a BlueCat Linux Demo System

This section illustrates how DHCP support can be added to a BlueCat Linux demo system. The `developer demo` is used as an example of a BlueCat Linux demo system. The steps below assume that the DHCP server is set up. For detailed information on setting up the DHCP server, refer to the *BlueCat Linux User's Guide*.

To add DHCP support to a BlueCat Linux 5.0 demo system, perform the following steps:

1. Activate the BlueCat Linux installation:

```
bash$ . SETUP.sh idp_pxa255
```
2. Change to the `developer demo` directory

```
BlueCat: bash$ cd $BLUECAT_PREFIX/demo/developer
```
3. Enable packet socket support in the kernel configuration file for the `developer demo` system. To change the kernel configuration, use either the `make menuconfig` or `make xconfig` command. The following

kernel configuration option from the **Networking Support** menu must be enabled (set to **Y**):

Networking options->Packet socket

4. Edit the `developer.spec` file to comment out the following line

```
#cp ${BLUECAT_PREFIX}/lib/tls/libpthread-*.so /lib/tls
```

and add the following lines:

```
mkdir -p /etc/sysconfig/
cp ${BLUECAT_PREFIX}/etc/sysconfig/* /etc/sysconfig/
cp ./local/ifcfg-eth0 /etc/sysconfig/network-scripts/

cp ${BLUECAT_PREFIX}/sbin/dhclient /sbin/
cp ${BLUECAT_PREFIX}/sbin/dhclient-script /sbin/
cp ${BLUECAT_PREFIX}/sbin/consoletype /sbin/
cp ${BLUECAT_PREFIX}/bin/sed /bin/
cp ${BLUECAT_PREFIX}/bin/uname /bin/
cp ${BLUECAT_PREFIX}/bin/basename /bin/
cp ${BLUECAT_PREFIX}/usr/bin/expr /usr/bin/
mkdir -p /etc/rc.d/init.d/
cp ${BLUECAT_PREFIX}/etc/rc.d/init.d/functions /etc/rc.d/init.d/

cp ${BLUECAT_PREFIX}/bin/sleep /bin/
mkdir -p /usr/var/lib/dhcp/
```

5. Create the `./local/ifcfg-eth0` file containing the following lines:

```
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=dhcp
```

6. Rebuild the demo system:

```
BlueCat:~# bash$ make clean
BlueCat:~# bash$ make all
```

7. Boot the resulting `developer.kdi` image on the target board.

8. On the system console, run the following command:

```
bash# dhclient
Internet Software Consortium DHCP Client V3.0p11
Copyright 1995-2001 Internet Software Consortium.
All rights reserved.
For info, please visit http://www.isc.org/products/DHCP

Listening on LPF/lo/
Sending on LPF/lo/
Listening on LPF/eth0/00:04:34:00:21:70
Sending on LPF/eth0/00:04:34:00:21:70
Sending on Socket/fallback
DHCPDISCOVER on lo to 255.255.255.255 port 67 interval 5
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 7
ip length 328 disagrees with bytes received 330.
accepting packet with data after udp payload.
DHCPOFFER from 172.17.0.6
DHCPREQUEST on eth0 to 255.255.255.255 port 67
```

```
ip length 328 disagrees with bytes received 330.  
accepting packet with data after udp payload.  
DHCPACK from 172.17.0.6  
bound to 172.17.3.200 -- renewal in 35925 seconds.
```

As a result, the network interface is configured:

```
-bash-2.05b# ifconfig  
eth0      Link encap:Ethernet  HWaddr 00:04:34:00:21:70  
          inet addr:172.17.3.200  Bcast:172.17.255.255  Mask:255.255.0.0  
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1  
          RX packets:2  errors:0  dropped:0  overruns:0  frame:0  
          TX packets:3  errors:0  dropped:0  overruns:0  carrier:0  
          collisions:0  txqueuelen:1000  
          RX bytes:688 (688.0 b)  TX bytes:750 (750.0 b)  
          Interrupt:27  Base address:0x300  DMA chan:8  
  
lo        Link encap:Local Loopback  
          UP LOOPBACK RUNNING  MTU:16436  Metric:1  
          RX packets:6  errors:0  dropped:0  overruns:0  frame:0  
          TX packets:6  errors:0  dropped:0  overruns:0  carrier:0  
          collisions:0  txqueuelen:0  
          RX bytes:1968 (1.9 Kb)  TX bytes:1968 (1.9 Kb)  
  
-bash-2.05b#
```


Table 5-1 lists the device drivers supported by the idp_pxa255 BSP and provides important information about them.

Table 5-1: Device Drivers Supported by the idp_pxa255 BSP

Hardware Device	Device Drivers	Location in Source Tree	Kernel Configuration Options	Notes
Flash 32 MB StrataFlash	arm_flash0.c	drivers/mtd/maps/	CONFIG_MTD CONFIG_MTD_IDP CONFIG_MTD_CFI CONFIG_MTD_CFI_INTELEXT	Supported via JFFS/JFFS2 and Flash management
Secure Digital/ MultiMedia Card Via Secure Digital (SD) connector	pxamci.c mmc.c mmc_block.c mmc_queue.c mmc_sysfs.c	drivers/mmc/	CONFIG_MMC CONFIG_MMC_BLOCK CONFIG_MMC_PXA	
RS-232 serial ports	pxa.c	drivers/serial/	CONFIG_SERIAL_PXA CONFIG_SERIAL_PXA_CONSOLE	
Ethernet 10/100 Base-T (SMSC LAN91C111)	smc91x.c	drivers/net/	CONFIG_SMC91X	
I ² C bus interface On-chip master and slave	i2c-algo-pxa.c i2c-pxa.c	drivers/i2c/busses/	CONFIG_I2C_PXA	Only master mode is supported.

This chapter describes known problems and limitations of this release.

Acelcent IDP PXA255 Target Board Problems and Limitations

The following are known problems and limitations of this release:

- Modification of the file system stored in a RAM disk does not persist across unmounting/mounting in BlueCat Linux 5.0. This limitation is due to a defect in the Linux kernel 2.6.0, described by official kernel maintainer Andrew Morton (www.lkml.org):

“Because the kernel considers the ramdisk as being ‘memory backed’ it doesn’t do writeback into the blockdev pagecache. If you remove the memory-backed flag, ramdisk contributes to dirty memory in undesirable ways. That memory-backed flag is too overloaded and needs to be split up. It’s something I need to fix, but nobody seemed to be hurting from it up to now so I figured it could wait until after 2.6.0.”

- Loading of a kernel module may fail with the following message:

```
module.o: unable to fixup relocation: out of range
```

To avoid this problem, either make sure that the `CONFIG_MODULE_UNLOAD` option is enabled or comment out `__exit` keywords in the kernel module source.

- The LynuxWorks Boot Loader may fail to initialize the on-board Ethernet controller after a `reboot` command has been issued from BlueCat Linux. In such a situation, reset the board using either the SW1 or SW3 switch.
- Hot Swap for the MMC card is not supported.

User Documentation Updates

- Chapter 4, “BlueCat Linux Demo Systems” in the *BlueCat Linux User’s Guide* provides incorrect values for the Storage and RAM requirements for the `developer` demo system. The correct requirements for `developer` are:
 - Storage: Medium
 - RAM: Large
- The information in the *BlueCat Linux User’s Guide* that states that `make xconfig` is supported on Linux hosts only is out of date. `make xconfig` is now also supported on Windows hosts.

Ensure that Microsoft Visual Studio 6.0 or higher is installed on the cross-development host and that the Visual Studio environment tools have been set up to allow invocation of the Microsoft Visual Studio tools in command line mode.

Then, to install the Qt library on the Windows host, go to www.trolltech.com and download the Qt software for Microsoft Visual Studio C++ Windows users. To install the Qt library, follow the instructions provided with the Qt software.

`$BLUECAT_PREFIX/usr/src/linux/scripts/kconfig/Makefile` (the `Makefile` for the Windows host) uses the `QTLIBS` environment variable to list the Qt libraries that are needed to link with the `qconf` executable used to implement `make xconfig` on the Windows host. The following default definition is used:

```
QTLIBS = qt-mteval323.lib qtmain.lib
```

This definition specifies that libraries from the Qt 3.2.3 evaluation version for Windows are needed to link with the `qconf` executable.

If the Qt version installed on the host differs from the Qt 3.2.3 evaluation version, the `QTLIBS` definition must be changed to specify the correct list of libraries. This can be done either by manually editing `$BLUECAT_PREFIX/usr/src/linux/scripts/kconfig/Makefile` to modify the `QTLIBS` definition or by defining the `QTLIBS` environment variable using the **Properties->Advanced->Environment Variables** wizard in the context menu of the **My Computer** icon on the Windows desktop. The second approach allows the user to avoid changing the `Makefile` every time BlueCat Linux is reinstalled.

APPENDIX A *bin2boot Source File*

Use the following source file for building the `bin2boot` utility:

```
#include <stdio.h>

#define          MAGICWORD "B000FF\n"
#define          STARTADDR 0x90000000
#define OUTFILE  "boot.bin"

int main(int argc, char *argv[])
{
    FILE          *fp1,*fp2;
    int           i,j;
    unsigned int  sum;
    unsigned char ch;
    char          *str=MAGICWORD;

    if ( argc == 2 )
    {
        printf("\nOpening image file %s",argv[1] );
        if ( ( fp1 = fopen( argv[1], "rb" ) ) == NULL )
        {
            printf("\nError! File not found.\n");
            exit (1);
        }
    }
    else
    {
        printf("\nUsage: bin2boot filename\n");
        exit (1);
    }

    i=0; j=1;
    sum=0;
    do
    {
        ch=fgetc(fp1);
        if (feof(fp1) == 0)
        {
            i++;
            sum += ch;
        }
        else j=0;
    }
    while (j);

    printf("\n\n File Lenght\t0x%x\n CheckSum\t0x%x\n",i,sum);
```

```
rewind(fp1);

if ( ( fp2 = fopen(OUTFILE,"wb" ) ) == NULL )
{
    printf("\nError! Could not open %s file.\n",OUTFILE);
    exit (1);
}
printf("\nWriting %s image file..",OUTFILE);

fputs(str,fp2);
j=STARTADDR;
fwrite(&j,sizeof(int),1,fp2);
fwrite(&l,sizeof(int),1,fp2);
fwrite(&j,sizeof(int),1,fp2);
fwrite(&l,sizeof(int),1,fp2);
fwrite(&sum,sizeof(int),1,fp2);

j=1;
do
{
    ch = fgetc(fp1);
    if (feof(fp1)==0)
        fputc(ch,fp2);
    else
        j=0;
}
while (j);

j=0;
fwrite(&j,sizeof(int),1,fp2);
j=STARTADDR;
fwrite(&j,sizeof(int),1,fp2);
j=0;
fwrite(&j,sizeof(int),1,fp2);

fclose(fp1);
fclose(fp2);

printf("\tDone.\n");

return 0;
}
```