

BlueCat Linux Board Support Guide

BlueCat Linux Release 5.1

DOC-0615-00

for ARM Integrator Boards

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U.S. Patents 5,469,571; 5,594,903

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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 filenames 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, filenames, 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 filename 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

```
Loading file /tftpboot/shell.kdi
into 0x4000
.....
File loaded. Size is 1314816
Copyright 2002 LynuxWorks, Inc.
All rights reserved.
```

```
LynxOS (ppc) created Mon Jan 17
17:50:22 GMT 2002
user name:
```

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.

This *BlueCat Linux Board Support Guide for ARM Integrator Boards* provides information about the BlueCat Linux Board Support Package (BSP) supporting ARM Integrator/AP boards with ARM920T CPU cores.

Throughout this Board Support Guide (BSG), the BSP is referred to as the “integrator” and the target board is referred to as the “Integrator/AP” or simply as the “target board.”

Features Overview

The following sections describe the new features of this release.

Kernel Version

BlueCat Linux release 5.1 is based on the Linux kernel version 2.6.7 available from www.kernel.org.

BlueCat Linux Cross-Development Tools

BlueCat Linux release 5.1 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
ARM Integrator/AP board with ARM920T CPU core	<ul style="list-style-type: none">• ARM ARM920T 32/16-bit RISC embedded processor• Up to 256 MB of SDRAM• FPGA system controller• 32 MB Flash memory via JFFS/JFFS2 and Flash management• PCI tested with an eeepro100 Ethernet card and a VideoLogic Neon 250PCI Video adapter• Two UART ports incorporated into FPGA• JTAG port via downloading and booting of BlueCat Linux using ARM Multi-ICE• PS/mouse• PC keyboard

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 integrator 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

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 for downloading and booting BlueCat Linux systems onto the user's target board. Scenarios that use demo systems included in the BlueCat Linux distribution are presented. A basic familiarity with the target board 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 ARM configuration and the integrator BSP have been installed on the cross-development host. This means that the user must:

1. Install the BlueCat Linux ARM 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 integrator BSP onto the cross-development host as detailed in the "Installing Target Board Support" section in Chapter 1, "Introduction and Installation" in the *BlueCat Linux User's Guide*.
3. Activate support for the integrator BSP as detailed in the "Activating Support for a Target Board" section in 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 on the Integrator/AP target consists of the following main steps:

- Setting up hardware
- Downloading and booting a BlueCat Linux system from target Flash memory or a network

Downloading and booting a BlueCat Linux system can be performed using one of the following:

- The LynuxWorks Boot Loader
- The BlueCat Linux OS loader demo system
- The ARM JTAG interface

NOTE: The JTAG Interface can be run only from a Windows host.

The LynuxWorks Boot Loader is 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 OS loader demo system includes the `i_osloader` and `osloader` downloadable images. `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/JFFS2) and can thus be used to download a 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 OS loader.

The JTAG Interface, also known as the Standard Test Access Port and Boundary-Scan Architecture, is a protocol that can be used for cross-debugging and testing purposes. The JTAG Interface connects to a parallel port on the host and to a JTAG Connector on the ARM Integrator board. JTAG allows for more user control in testing and debugging than a standard PROM. JTAG communicates directly with target hardware by establishing control over the CPU.

Setting up the Hardware

Connecting the Target Board Serial Ports to the Host

The target board has two serial ports. The first port is used both by the LynuxWorks Boot Loader firmware 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 first target serial port has a baud rate of 38400.
- The serial port connected to the second target serial port has a baud rate of 38400.

Throughout this chapter, the terminal window connected to the first 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 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.

There is an Ethernet port on the target board. The user must use this port to connect the Integrator/AP board to a LAN.

It 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 the host operating system documentation.

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 Boot Loader into Flash on Integrator/AP

To install Boot Loader on the Integrator/AP board, the on-board Flash chip must be programmed with the Boot Loader image
(`$BLUECAT_PREFIX/boot/integrator.bin`).

This can be done using the Boot Monitor software located in the Integrator/AP Boot ROM. To install Boot Loader using Boot Monitor, perform the following steps:

1. Create an SREC image of Boot Loader, using the following command:

```
BlueCat:~# arm-lynx-linux-bluecat-objcopy -I \
binary -O srec $BLUECAT_PREFIX/boot/ \
integrator.bin integrator.srec \
--change-address=0x24000000
```

2. Set up the Integrator/AP board to boot from the Boot ROM by setting the S1[1] and S1[4] DIP switches to the ON position.
3. Depending on the host operating system, connect to the first Integrator/AP console using either the terminal or hyperterminal application:

- For Linux hosts, use a terminal application with the following settings:

Baud rate—38400

Flow control—None

- For Windows hosts, use a hyperterminal application with the following settings:

Baud rate—38400

Flow control—Xon/Xoff

4. Power up the Integrator/AP board. The Boot Monitor prompt will appear at the first serial console:

```
ARM bootPROM [Version 1.3] Rebuilt on Feb 28 2001 at 11:18:48
Running on a Integrator Evaluation Board
Board Revision V1.0, ARM920T Processor
Memory Size is 64MBytes, Flash Size is 32MBytes
Copyright (c) ARM Limited 1999 - 2001. All rights reserved.
Board designed by ARM Limited
Hardware support provided at http://www.arm.com/
For help on the available commands type ? or h
boot Monitor >
```

5. Enter the `L` command at the Boot Loader prompt to load the Boot Loader image:

```
boot Monitor > L
Load Motorola S-Records into flash
Type Ctrl/C to exit loader.
```

6. Perform the following additional steps, depending on the host operating system:

- For Linux hosts:

- a. Exit the terminal program connected to the first Integrator/AP serial port and enter the following commands at the bash prompt:

```
bash$ stty -F /dev/ttyS0 ospeed 38400
bash$ cat integrator.srec > /dev/ttyS0
```

These commands assume that the host serial port to which the first Integrator/AP serial port is connected is `/dev/ttyS0`. For other ports, replace `/dev/ttyS0` with the proper port name.

- b. When the `cat` command completes, run the terminal application again and press **Ctrl-C**:

```
Downloaded 16,386 records in 210 seconds.
Overwritten block/s
0 1 2
boot Monitor >
```

- For Windows hosts:

- a. Go to the **File/Properties** menu, select the **Settings** tab, press the **ASCII Setup** button, and turn on the **Echo typed characters locally** check box.
- b. In the hyperterminal application, go to the **Transfer/Send Text File** submenu and select the `integrator.srec` file.
- c. When the transfer process completes, hit **Ctrl-C**:

```
Downloaded 16,386 records in 210 seconds.
Overwritten block/s
0 1 2
boot Monitor >
```

- d. Turn off the **Echo typed characters locally** check box in the **Settings** tab of the **File/Properties** menu.

7. Boot Loader is programmed to Flash now. To start it, power off the Integrator/AP board and set the S1[1] and S1[3] DIP switches to the OFF position (the S1[4] switch must be left ON). Power on the board.

The Boot Loader prompt will now appear at the first Integrator/AP serial console:

```
BootLoader v2.0. Copyright 2002 LynuxWorks, Inc. All rights reserved.
Secondary Bootloader module started from 0x24020000
RAM: 63Mb (0x00100000 - 0x04000000)
SBM: 82Kb (0x00100000 - 0x00114a58)
Malloc pool: 429Kb (0x00114a58 - 0x00180000)
Free memory: 62Mb (0x00180000 - 0x04000000)
integrator>
```

Setting up the LynuxWorks Boot Loader Firmware

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

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

```
integrator> set autoboot 0
integrator> set boot_tftp_host_ip \
<development_host_IP>
integrator> set boot_tftp_client_ip \
<target_board_IP>
integrator> set flash_tftp_host_ip \
<development_host_IP>
integrator> set flash_tftp_client_ip \
<target_board_IP>
integrator> 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 to Flash

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

Specifically, these instructions are applicable to any of the demo systems. This chapter uses the `developer` demo system as an example.

Downloading a BlueCat Linux System to Flash Using Boot Loader

To download `developer` into the target board using the LynuxWorks Boot Loader, perform the following steps:

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

```
integrator> set flash_device tftp
integrator> set flash_tftp_file developer.kdi
integrator> set flash_target flash0
integrator> set flash_offset 0x80000
integrator> flash
```

After these commands have been performed, the `developer` demo system is programmed into Flash and can be booted as described in “Booting a Demo System from Flash” below.

Downloading a BlueCat Linux System to Flash Using the OS Loader

To download `developer` into the target board using the OS loader, perform the following steps:

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

```
integrator> set boot_device tftp
integrator> set boot_tftp_file i_osloader.kdi
integrator> set boot_os BlueCat
integrator> boot
```

These commands load the `i_osloader` system to RAM and start it. As a result, the OS loader prompt (`>`) appears in the BlueCat Linux console.

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

```
> set IF eth0
> set IP <target_board_IP>
> set HOST <development_host_IP>
> set FILE tftp developer.kdi
> exec flash_fdisk /dev/mtdchar0 4-45
> flash /dev/mtdchar1 erase
> reset
```

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

After these commands have been performed, the `developer` demo system is programmed into the Flash and can be booted as described below.

Booting a Demo System from Flash

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 to Flash” on page 10.

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

```
integrator> set boot_device flash0
integrator> set boot_flash_offset 0x80000
integrator> set boot_os BlueCat
integrator> boot
```

These commands start the demo system programmed into the Flash at offset `0x80000`.

The Integrator/AP board can be configured to start a demo system programmed into Flash automatically at the board power-up. Use the following commands to prepare the Integrator/AP board to boot BlueCat Linux from Flash automatically:

```
integrator> set boot_device flash0
integrator> set boot_flash_offset 0x80000
integrator> set boot_os BlueCat
```

```
integrator> set autoboot 1
integrator> save
```

Downloading a BlueCat Linux System via the ARM JTAG Interface

This section provides instructions for downloading BlueCat Linux demo systems from a cross-development host into a target board's RAM via the ARM JTAG parallel port interface. The scenario described below assumes the target and host are connected via the JTAG interface. Refer to your JTAG manufacturer documentation.

Downloading a BlueCat Linux System to Flash

To download `i_osloader` on the target board, perform the following steps:

1. Procure the ARM AXD debugger. The ARM Flash utility (AFU), `afu.axf`, is run from the ARM AXD debugger. Copy this utility onto the Windows host.

This utility permits copying a BlueCat Linux image in ELF format into the target board's Flash memory.

2. Prepare an `i_osloader` Kernel Downloadable Image (KDI) suitable for booting from the target board Flash. Enter the following command at the BlueCat Linux prompt on the host to create an ELF-formatted version of `i_osloader`:

```
BlueCat:$ ld -o i_osloader -Ttext 0x800000 \
-e 0x800000 -b binary i_osloader.kdi
```

3. Change both the S1[1] DIP and S1[4] DIP switches to the ON position.
4. Using the JTAG debugger interface running on the Windows host, download `afu.axf` (the ARM Flash utility) onto the target board RAM.
5. The AFU prompt (AFU>) comes up on the JTAG debugger console. There are several commands that can be run from the AFU prompt. For a list of AFU commands, type `help` at the AFU> prompt. For a list of all downloaded files, type `list` at the AFU> prompt.

```
Copyright ARM Ltd. 1999 - 2001. All rights reserved.
ARM Flash Utility
Program Version 1.3
```

```
Date: 18 Jan 2001
Searching for flash devices
Flash device 1 found at 0x20000000 (4 blocks of size 0x20000)
Flash device 2 found at 0x24000000 (256 blocks of size 0x20000)
Device 1 found as Boot device - defaulting to Device 2
Scanning Flash blocks for usage
AFU> list
Listing images in Flash
Scanning Flash blocks for usage
Image 600 Block 0 End Block 28 address 0x24000000 exec 0x00800000 -
name Developer
SIB at Block 255 End Block 255 address 0x25fe0000
AFU>
```

Note the format of the screen output. The list of files downloaded is displayed with the following information: Starting and ending block, name, physical address, and image number.

Of all the fields, the name and the image number are important to note for subsequent steps.

6. From the JTAG debugger console AFU> prompt, program Integrator/AP Flash with the `i_osloader` image. The AFU `program` command is used for this purpose. The syntax of the command is as follows:

```
AFU> program <image_number> <name> <absolute_path>
```

where `<image_number>` is a user-specified image number chosen from the list of AFU image numbers, `<name>` is a name given by the user to the image to be downloaded, and `<absolute_path>` is the absolute address of the image file.

The following command programs an image named `i_osloader` with an image number of 601:

```
AFU> program 601 i_osloader c:\bc\i_osloader
```

7. Restart the target system from the MultiIce Server software (ARM JTAG-dependent).
8. Use the `boot Monitor>` prompt at the serial console to specify the number of the image to be booted. The following command boots image number 601 programmed in Step 5 above.

```
boot Monitor> bi 601
Current Boot Image = 0
New Boot Image = 601
boot Monitor>
```

9. Change the S1[1] DIP switch to the ON position and the S1[4] DIP switch to the OFF position.

10. Restart the system. The BlueCat Linux OS loader prompt (>) should appear after system reset.

The benefit of using `i_osloader` is that from its location in target Flash memory, it enables demos and custom systems to be run from target RAM without having to burn them into Flash each time.

Booting a Demo System from a Network

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

Booting a Demo System from a Network Using the Boot Loader Firmware

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

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

```
integrator> set boot_device tftp
integrator> set boot_tftp_file developer.kdi
integrator> set boot_os BlueCat
integrator> boot
```

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

Booting a Demo System from a Network Using the OS Loader

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

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

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

These commands start the `osloader` demo system from RAM. As a result, the OS loader prompt (`>`) will appear in the BlueCat Linux console.

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

```
> set IF eth0
> set IP <target_board_IP>
> set HOST <development_host_IP>
> set KERNEL tftp developer.kernel
> set RFS tftp developer.rfs
> set CMD ramdisk_size=28472
> 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 `developer` demo system from a network onto the target board and then automatically start it.

Kernel Configuration Options

The integrator 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 integrator BSP Distribution” below. Boldfaced entries in the tables represent subordinate menus. Italicized entries represent comments.

Table 3-1: BlueCat Linux Default Configuration for the integrator 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: “Block Devices”
Table 3-10: “Multidevice Support (RAID and LVM)”
Table 3-11: “Networking Support”
Table 3-12: “SCSI Device Support”
Table 3-13: “IEEE 1394 (FireWire) Support”
Table 3-14: “I ² O Device Support”
Table 3-15: “ISDN Subsystem”
Table 3-16: “Input Device Support”

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

Table Number and Configuration Parameter
Table 3-17: “Character Devices”
Table 3-18: “I ² C Support”
Table 3-19: “Multimedia Devices”
Table 3-20: “File Systems”
Table 3-21: “Profiling Support”
Table 3-22: “Graphics Support”
Table 3-23: “Sound”
Table 3-24: “USB Support”
Table 3-25: “Kernel Hacking”
Table 3-26: “Security Options”
Table 3-27: “Cryptographic Options”
Table 3-28: “Library Routines”

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 (swap)	is not set
System V IPC	Y
POSIX Message Queues	is not set

Table 3-3: General Setup (Continued)

Description	Setting
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
Sysctl support	Y
Auditing support	is not set
Support for hot-pluggable devices	is not set
Kernel <code>.config</code> support	is not set
Configure Standard Kernel Features (for Small Systems)	
Load all symbols for debugging/ <code>kksymoops</code>	is not set
Enable futex support	Y
Enable eventpoll support	Y
No-op I/O scheduler	Y
Anticipatory I/O scheduler	Y
Deadline I/O scheduler	Y
CFQ I/O scheduler	Y
CODETEST Device Driver Configuration	is not set
Optimize for size	is not set

Table 3-4: Loadable Module Support

Description	Setting
Enable loadable module support	Y
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 (Integrator)	
ADIFCC-based	is not set
Cirrus-CL-PS7500FE	is not set
CLPS711x/EP721x-based	is not set
Co-EBSA285	is not set
EBSA-110	is not set
Epxa10db	is not set
FootBridge	is not set
Integrator	Y
IOP3xx-based	is not set
IXP4xx-based	is not set
LinkUp-L7200	is not set
PXA2xx-based	is not set
RiscPC	is not set
SA1100-based	is not set
Samsung S3C2410	is not set
Shark	is not set
Sharp LH7A40X	is not set
TI OMAP	is not set
Versatile PB	is not set
Integrator Options	
Support Integrator/AP and Integrator/PP2 platforms	Y
Support Integrator/CP platform	is not set
Include support for Integrator/IM-PD1	is not set
--- <i>Processor Type</i>	

Table 3-5: System Type (Continued)

Description	Setting
Support ARM720T processor	is not set
Support ARM920T processor	Y
Support ARM926T processor	is not set
Support ARM1020T (rev 0) processor	is not set
Support ARM1022E processor	is not set
Support ARM1026EJ-S processor	is not set
Support ARM V6 processor	is not set
<i>--- Processor Features</i>	
Support Thumb user binaries	is not set
Disable I-Cache	is not set
Disable D-Cache	is not set
Force write through D-cache	is not set

Table 3-6: Architecture-Dependent General Setup

Description	Setting
PCI support	Y
Compressed boot loader in ROM/Flash	is not set
Compressed ROM boot loader base address	0x0
Compressed ROM boot loader BSS address	0x0
Support CPU clock change (Experimental)	is not set
Legacy <code>/proc/pci</code> interface	is not set
PCI device name database	Y
<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

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

Description	Setting
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
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>	

Table 3-8: Memory Technology Devices (Continued)

Description	Settings
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
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 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	Y
CFI Flash device mapped on EDB7312	is not set
Self-contained MTD Device Drivers	
Ramix PMC551 PCI Mezzanine RAM card support	is not set
Uncached system RAM	is not set
Test driver using RAM	is not set
MTD emulation using block device	is not set

Table 3-8: Memory Technology Devices (Continued)

Description	Settings
<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: Block Devices

Description	Settings
Normal floppy disk support	is not set
Compaq SMART-2 support	is not set
Compaq Smart Array 5xxx support	is not set
Mylex DAC960/DAC1100 PCI RAID Controller support	is not set
Micro Memory MM5415 Battery Backed RAM support (Experimental)	is not set
Loopback device support	is not set
Network block device support	is not set
Promise SATA SX8 (carmel) support	is not set
RAM disk support	Y
Default RAM disk size (kbytes)	4096
Initial RAM disk (<code>initrd</code>) support	is not set
BlueCat Linux RFS support	Y

Table 3-10: Multidevice Support (RAID and LVM)

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

Table 3-11: Networking Support

Description	Settings
Networking Support	Y
Networking Options	
Packet socket	Y
Packet socket: mmaped IO	is not set
Netlink device emulation	Y
UNIX domain sockets	Y
PF_KEY sockets	is not set
TCP/IP networking	Y
IP: multicasting	Y
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: multicast routing	is not set
IP: ARP daemon support (Experimental)	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

Table 3-11: Networking Support (Continued)

Description	Settings
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
802.1d Ethernet Bridging	is not set
802.1Q VLAN support	is not set
DECnet 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
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
Amateur Radio support	is not set
IrDA (infrared) subsystem support	is not set
Bluetooth subsystem support	is not set
Network device support	Y
Dummy net driver support	is not set

Table 3-11: Networking Support (Continued)

Description	Settings
Bonding driver support	is not set
EQL (serial line load balancing) support	is not set
Universal TUN/TAP device driver support	is not set
Ethern tap network tap	is not set
ARCnet devices	
ARCnet support	is not set
IBM On-chip net device	
Ethernet (10 or 100Mbit)	
Ethernet (10 or 100Mbit)	Y
<i>--- Generic Media Independent Interface device support</i>	
Sun happy Meal 10/100baseT support	is not set
Sun GEM support	is not set
3Com cards	is not set
“Tulip” family network device support	
“Tulip” family network device support	is not set
HP 10/100VG PCLAN (ISA, EISA, PCI) support	is not set
EISA, VLB, PCI, and on-board controllers	Y
AMD PCnet32 PCI support	is not set
AMD 8111 (new PCI lance) support	is not set
Adaptec Starfire/DuraLAN support	is not set
Broadcom 4400 Ethernet support (Experimental)	is not set
Reverse Engineered nForce Ethernet support (Experimental)	is not set
Digi International RightSwitch SE-X support	is not set
EtherExpressPro/100 support (eepro100, original Becker driver)	Y
Use PIO instead of MMIO	is not set
Intel® PRO/100+ support	is not set

Table 3-11: Networking Support (Continued)

Description	Settings
Myson MTD-8xx PCI Ethernet support	is not set
National Semiconductor DP8381x series PCI Ethernet support	is not set
PCI NE2000 and clones support (see help)	is not set
Realtek RTL-8139 C+ PCI Fast Ethernet Adapter support (Experimental)	is not set
Realtek RTL-8139 PCI Fast Ethernet Adapter support	is not set
SiS 900/7016 PCI Fast Ethernet Adapter support	is not set
SMC EtherPower II	is not set
Sundance Alta support	is not set
TI ThunderLAN support	is not set
VIA Rhine support	is not set
Ethernet (1000 Mbit)	
Alteon AceNIC/3Com 3C985/NetGear GA620 Gigabit support	is not set
D-Link DL2000-based Gigabit Ethernet support	is not set
Intel PRO/1000 Gigabit Ethernet support	is not set
National Semiconductor DP83820 support	is not set
Packet Engines Hamachi GNIC-II support	is not set
Packet Engines Yellowfin Gigabit-NIC support (Experimental)	is not set
Realtek 8169 Gigabit Ethernet support	is not set
Marvell Yukon Chipset/SysKonnect SK-98xx support	is not set
Broadcom Tigon3 support	is not set
Ethernet (10000 Mbit)	
Intel PRO/10GbE support	is not set
S2IO 10Gbe XFrame NIC	is not set
Token Ring Devices	
Token Ring driver support	is not set

Table 3-11: Networking Support (Continued)

Description	Settings
Wireless LAN (Non-Ham Radio)	
Wireless LAN drivers (non-ham radio) and Wireless Extensions	is not set
WAN Interfaces	
WAN interfaces support	is not set
Fiber Distributed Data Interface (FDDI) driver support	is not set
High Performance Parallel Interface (HIPPI) driver support (Experimental)	is not set
Point-to-Point Protocol (PPP) support	is not set
Serial Line Internet Protocol (SLIP) support	is not set
Traffic Shaper (Experimental)	is not set
Network console logging support (Experimental)	is not set

Table 3-12: SCSI Device Support

Description	Settings
SCSI device support	is not set

Table 3-13: IEEE 1394 (FireWire) Support

Description	Settings
IEEE 1394 (FireWire) support	is not set

Table 3-14: I²O Device Support

Description	Settings
I ² O support	is not set

Table 3-15: ISDN Subsystem

Description	Settings
ISDN support	is not set

Table 3-16: Input Device Support

Description	Settings
<i>--- Input devices (needed for keyboard, mouse,...)</i>	
<i>---Userland interfaces</i>	
Mouse interface	Y
Provide legacy /dev/psaux device	Y
Horizontal screen resolution	1024
Vertical screen resolution	768
Joystick interface	is not set
Touchscreen interface	is not set
Event interface	is not set
Event debugging	is not set
<i>--- Input I/O Drivers</i>	
Gameport support	is not set
<i>--- Serial I/O support</i>	
i8042 PC Keyboard controller	is not set
Serial port line discipline	Y
ct82c710 Aux port controller	is not set
AMBA KMI keyboard controller	Y
PCI PS/2 keyboard and PS/2 mouse controller	is not set
<i>--- Input Device Drivers</i>	
Keyboards	Y

Table 3-16: Input Device Support (Continued)

Description	Settings
AT keyboard support	Y
Sun Type 4 and Type 5 keyboard support	is not set
DECstation/VAXstation LK201/LK401 keyboard support	is not set
XT keyboard support	is not set
Newton keyboard	is not set
Mice	Y
PS/2 mouse	Y
Serial mouse	is not set
DEC VSXXX-AA/GA mouse and VSXXX-AB tablet	is not set
Joysticks	is not set
Touchscreens	is not set
Misc	is not set

Table 3-17: Character Devices

Description	Settings
Virtual terminal	Y
Support for console on virtual terminal	Y
Nonstandard serial port support	Y
Computone IntelliPort Plus serial support	is not set
Control RocketPort support	is not set
Cyclades async mux support	is not set
Digiboard Intelligent Async support	is not set
Digiboard PC/Xx support	is not set
Moxa Intellio support	is not set
Moxa SmartIO support	is not set
Multi-Tech multiport card support (Experimental)	is not set

Table 3-17: Character Devices (Continued)

Description	Settings
Microgate SyncLink card support	is not set
SyncLink Multiport support	is not set
HDLC line discipline support	is not set
SDL RISCom/8 card support	is not set
Specialix IO8+ card support	is not set
Specialix SX (and SI) card support	is not set
Specialix RIO system support	is not set
Stallion multiport serial support	is not set
Serial Drivers	
8250/16550 and compatible serial support	is not set
<i>--- Non-8250 serial port support</i>	
ARM AMBA PL010 serial port support	Y
Support for console on AMBA serial port	Y
ARM AMBA PL011 serial port support	is not set
Unix98 PTY support	Y
Legacy (BSD) PTY support	Y
Maximum number of legacy PTYs in use	256
QIC-02 tape support	is not set
IPMI	
IPMI top-level message handler	is not set
Watchdog Cards	
Watchdog timer support	Y
Disable watchdog shutdown on close	is not set
<i>--- Watchdog Device Drivers</i>	
Software watchdog	Y
<i>--- PCI-based Watchdog Cards</i>	

Table 3-17: Character Devices (Continued)

Description	Settings
Berkshire Products PCI-PC Watchdog	is not set
PCI-WDT500/501 Watchdog timer	is not set
/dev/nvram support	is not set
Enhanced Real Time Clock support	is not set
Generic /dev/rtc emulation	is not set
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) (Obsolete)	is not set

Table 3-18: I²C Support

Description	Settings
I ² C support	is not set

Table 3-19: Multimedia Devices

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

Table 3-20: 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
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
sysfs file system support	is not set
/dev file system support (Obsolete)	is not set
/dev/pts Extended Attributes	is not set
Virtual memory file system support (former shm file system)	Y
Miscellaneous File Systems	
ADFS file system support (Experimental)	is not set

Table 3-20: File Systems (Continued)

Description	Setting
Amiga FFS file system support (Experimental)	is not set
Apple Macintosh file system support (Experimental)	is not set
Apple Extended HFS file system support	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
Journalling Flash File System (JFFS) support	Y
JFFS debugging verbosity (0 = quiet, 3 = noisy)	0
Journalling Flash File System v2 (JFFS2) support	Y
JFFS2 debugging verbosity (0 = quiet, 2= noisy)	0
JFFS2 support for HAND Flash (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
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	Y
Provide NFSv3 client support	Y
Provide NFSv4 client support (Experimental)	Y
Allow direct I/O on NFS files (Experimental)	is not set
NFS server support	Y
Provide NFSv3 server support	Y
Provide NFSv4 server support (Experimental)	Y
Provide NFS server over TCP support (Experimental)	is not set
--- <i>Secure RPC: Kerberos V mechanism (Experimental)</i>	

Table 3-20: File Systems (Continued)

Description	Setting
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
Andrew File System (AFS) support (Experimental)	is not set
Partition Types	
Advanced partition selection	is not set
Native Language Support	
Base native language support	is not set

Table 3-21: Profiling Support

Description	Settings
Profiling support (Experimental)	is not set

Table 3-22: Graphics Support

Description	Settings
Support for frame buffer devices	Y
NEC neon 250 support	Y
Permedia2 support	is not set
CyberPro 2000/2010/5000 support	is not set
Chips 69000 display support	is not set
IMS Twin Turbo display support	is not set
nVidia Riva support	is not set
Matrox acceleration	is not set

Table 3-22: Graphics Support (Continued)

Description	Settings
ATI Radeon display support (Old driver)	is not set
ATI Radeon display support	is not set
ATI Rade128 display support	is not set
ATI Mach64 display support	is not set
SiS acceleration	is not set
NeoMagic display support	is not set
IMG Kyro support	is not set
3Dfx Banshee/Voodoo3 display support	is not set
3Dfx Voodoo Graphics (sst1) support	is not set
Trident support	is not set
Virtual Frame Buffer support (Only for testing!)	is not set
Console display driver support	
VGA text console	Y
MDA text console (dual-headed) (Experimental)	is not set
Frame Buffer console support	Y
Select compiled-in fonts	Y
VGA 8x8 font	Y
VGA 8x16 font	Y
Mac console 6x11 font (not supported by all drivers)	is not set
Pearl (old m68k) console 8x8 font	is not set
Acorn console 8x8 font	is not set
Mini 4x6 font	is not set
Sparc console 8x16 font	is not set
Sparc console 12x22 font (not supported by all drivers)	is not set
Logo configuration	
Bootup logo	is not set

Table 3-23: Sound

Description	Setting
Sound card support	is not set

Table 3-24: USB Support

Description	Setting
Support for host-side USB	is not set
USB Gadget Support	
Support for USB Gadgets	is not set

Table 3-25: Kernel Hacking

Description	Setting
Include Frame Pointer	is not set
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 3-26: Security Options

Description	Setting
Enable different security models	is not set

Table 3-27: Cryptographic Options

Description	Setting
<i>--- Cryptographic API</i>	
HMAC support	is not set
Null algorithms	is not set
MD4 digest algorithm	is not set
<i>--- MD5 digest algorithm</i>	
SHA1 digest algorithm	is not set
SHA256 digest algorithm	is not set
SHA384 and SHA512 digest algorithms	is not set
<i>--- DES and Triple DES EDE cipher algorithms</i>	
Blowfish cipher algorithm	is not set
Twofish cipher algorithm	is not set
Serpent cipher algorithm	is not set
AES cipher algorithms	is not set
CAST5 (CAST-128) cipher algorithm	is not set
CAST6 (CAST-256) cipher algorithm	is not set
ARC4 cipher algorithm	is not set
Deflate compression algorithm	is not set
Michael MIC keyed digest algorithm	is not set
CRC32c CRC algorithm	is not set
Testing module	is not set

Table 3-28: Library Routines

Description	Setting
<i>--- CRC32 functions</i>	
CRC32c (Castagnoli et al.) Cyclic Redundancy-Check	is not set

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

Demo Systems

Table 4-1 lists demo systems supported by the integrator BSP, their default boot devices, and their RAM and ROM requirements.

Table 4-1: Demo Systems Supported by the integrator BSP

Demo System	Default Supported Boot Device(s)	ROM Requirements	RAM Requirements
developer	Ethernet (using BlueCat Linux OS loader) Ethernet (using LynuxWorks Boot Loader) Flash (using BlueCat Linux OS loader) Flash (using LynuxWorks Boot Loader)	4809 KB	22196 KB
osloader	Ethernet (using LynuxWorks Boot Loader) Flash (using LynuxWorks Boot Loader)	1114.5 KB	5156 KB
showcase	Ethernet (using BlueCat Linux OS loader) Ethernet (using LynuxWorks Boot Loader) Flash (using BlueCat Linux OS loader) Flash (using LynuxWorks Boot Loader)	3996 KB	16346 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 onto a 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. In addition, specifically for the Integrator/AP target, `showcase` is extended with a simple application demonstrating the Micro Windows GUI framework.

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

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

Hardware Device	Device Drivers	Location in Source Tree	Kernel Configuration Options
UART	amba-pl010.c	drivers/serial	CONFIG_SERIAL_AMBA_PL010 CONFIG_SERIAL_AMBA_PL010_CONSOLE
Ethernet Intel PRO/100	eepro100.c	drivers/net	CONFIG_EEPRO100
Flash Intel 28F32053	arm_flash0.c	drivers/mtd/maps	CONFIG_MTD_ARM_INTEGRATOR
Keyboard PS/2	ambakmi.c atkbd.c	drivers/input/serio drivers/input/keyboard	CONFIG_SERIO_AMBAKMI CONFIG_KEYBOARD_ATKBD
Mouse PS/2	pcmouse-base.c	drivers/input/mouse	CONFIG_MOUSE_PS2
Video NEC PowerVR NEON 250	neon250fb.c	drivers/video/neon	CONFIG_FB_NEON

This chapter describes known problems and limitations of this release.

Integrator/AP 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 5.1. This limitation is due to a defect in the Linux kernel 2.6, 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.”

- The default rate of the target serial ports is 38400 bps. Make sure that an application that connects to the target over a serial line is configured to use this rate. For example, for the cross-debugger do the following:

```
gdb -b 38400
```

- Use the following command in order to use Ethernet in the `i_osloader` demo system:

```
make -f Makefile.i xconfig
```

Enable your network card, then type the following command:

```
make -f Makefile.i all
```

The demo now will have a correct Ethernet configuration and can be used to boot other BlueCat Linux demos over the network.

- The `showcase` demo needs to have a VGA card, PS/2 mouse, and PS/2 keyboard connected in order to run.
- If `mkrootfs` is terminated (either by an error or by a signal), it tries to clean all its temporary files before exiting. Due to certain features of the Cygwin execution environment, however, such temporary files can remain uncleaned in the `/tmp` directory on a Windows host. It is recommended that the `/tmp` directory be regularly checked and cleaned.
- On Windows hosts, some file permissions (including `r` and `s`) always have default values. To set permissions different from the default values, the `chmod` command should be used in the `.spec` file.

User Documentation Updates

- The “Booting from RAM using an NFS Server” section in Chapter 3, “Downloading and Booting BlueCat Linux” in the *BlueCat Linux User's Guide* contains incorrect commands. Please use the following commands to boot a BlueCat Linux system on the target board from an NFS server.

```
> set IP <target_IP_address>
> set HOST <host_IP_address>
> set IF <ethernet_interface>
> set KERNEL nfs /nfsboot <name>.kernel
> set RFS nfs /nfsboot <name>.rfs
> boot
```

- The “Mounting a Root File System from NFS” section in Chapter 3, “Downloading and Booting BlueCat Linux” in the *BlueCat Linux User's Guide* contains incorrect commands. Please use the following commands to boot a BlueCat Linux kernel that mounts an NFS-based file system as the root file system.

```
> set IP <target_IP_address>
> set HOST <host_IP_address>
> set IF <ethernet_interface>
> set KERNEL tftp /tftpboot/<name>.kernel
> set CMD console=ttyS1 root=/dev/nfs rw \
nfsroot=<host_IP_address>:/nfsboot \
ip=<target_IP_address>:<host_IP_address>:::::off \
panic=1
> boot
```

- 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.

