BlueCat Linux Board Support Guide

BlueCat Linux Release 5.5

DOC-0775-00

for Motorola MPC5200 Lite5200/Lite5200B 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 Release Notes*

  This printed document contains late-breaking information about the current release of BlueCat Linux.

- *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	`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

CHAPTER 1 *Overview*

The *BlueCat Linux Board Support Guide for Lite5200/Lite5200B* Boards provides information about the BlueCat Linux Board Support Package (BSP) for the Lite5200/Lite5200B board.

The Motorola MPC5200 Lite5200/Lite5200B evaluation board is based on a 400 MHz MPC603e processor core with an integrated double precision Floating Point Unit that operates at -40 to 85 degrees C. The MPC5200 was designed for fast data throughput and processing. The integrated BestComm DMA controller offloads the main MPC603e core from I/O intensive data transfers. An integrated Double Data Rate (DDR) memory controller accelerates data access with an effective memory bus speed of 266 MHz. A high-speed PCI interface backed by the BestComm DMA controller and DDR support enables high-speed data transfers in and out of the MPC5200. The MPC5200 is well suited for networking, industrial control, and automotive applications. The MPC5200 serves the processing-intensive network gateway, automotive, Internet access, industrial automation, image detection/analysis, and electronic/medical instrumentation markets.

Throughout this Board Support Guide (BSG), the BSP is referred to as the "*lite5200*" and the target board is referred to as either the "*Lite5200 board*" or the "*Lite5200B board*." If the instructions are common for both MPC5200 Lite5200 and Lite 5200B boards, the target board is referred to simply as the "*target board*."

Features Overview

This following sections describe the new features of this release.

Kernel Version

BlueCat Linux release 5.5 is based on the Linux kernel version 2.6.18.3 available from `www.kernel.org`.

BlueCat Linux Cross-Development Tools

BlueCat Linux release 5.5 supports the following versions of the GNU toolchain:

- `gcc` version 4.1.1
- `binutils` version 2.17

gdb

BlueCat Linux release 5.5 supports `gdb` version 6.5.

BlueCat Linux Target Components

BlueCat Linux release 5.5 uses Fedora Core 6 as a codebase for the target RPM packages.

Read-Only Flash Partitions Support

BlueCat Linux release 5.5 provides support for read-only Flash partitions.

To make Flash partitions read-only, add the `r` character to the end of configuration string of the `flash_fdisk` utility. Refer to *BlueCat User's Guide* for a detailed description of `flash_fdsik` configuration string options.

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
Lite5200 board	• MPC603e PowerPC processor core with a double-precision FPU • Big-endian • 64 MByte SDR & DDR SDRAM • 16 KByte instruction cache, 16 KByte data cache integrated to the MPC603e PowerPC core • Memory Managements Units, one for each cache integrated to the MPC603e PowerPC core • Built-in BestComm DMA I/O subsystem • Built-in interrupt controller manages 4 external interrupt request lines and 47 internal interrupt sources • 16MByte Flash Am29LV0652D • I^2C on-chip controller designed to support 520 Kbps transfer rates • On-board 256 Byte PCF8582C I2C EEPROM. • USB 1.1 on-chip OHCI host controller • Peripheral Serial Controller (PSC1) with transceiver • On-chip PCI Compatible external bus • Dual CAN2.0 A/B built-in Controller modules • Built-in Fast Ethernet controller (FEC) with a 10 Mbps and 100 Mbps IEE 802.3 MII and 10 Mbps 7-wire interface • Multiple, reconfigurable GPIO
Lite5200B board	• MPC603e PowerPC processor core with a double-precision FPU • Big-endian • 256 MByte SDR and DDR SDRAM • 16 KByte instruction cache, 16 KByte data cache integrated to the MPC603e PowerPC core • Memory Managements Units, one for each cache integrated to the MPC603e PowerPC core • Built-in BestComm DMA I/O subsystem • Built-in interrupt controller manages 4 external interrupt request lines and 47 internal interrupt sources • Two banks of 16 MByte Spansion S29GL128N Flash • I^2C on-chip controller designed to support 520 Kbps transfer rates • On-board 256 Byte PCF8582C I2C EEPROM. • USB 1.1 on-chip OHCI host controller • Peripheral Serial Controller (PSC1) with transceiver

Table 1-1: Hardware Supported (Continued)

Model	Description
Lite5200B board (cont.)	• On-chip PCI-compatible external bus • Dual CAN2.0 A/B built-in Controller modules • Built-in Fast Ethernet controller (FEC) with a 10 Mbps and 100 Mbps IEE 802.3 MII and 10 Mbps 7-wire interface • Multiple, reconfigurable GPIO

Available LynuxWorks Development Tools

Please contact your LynuxWorks Account Manager for information about the availability of the following premium LynuxWorks development tools on the cross-development platforms listed for use with this BSP:

- Luminosity—an Eclipse-based IDE providing an enhanced tool set that enables embedded system developers to accelerate product time-to-market in the aerospace, telecommunications, and military sectors
- SpyKer—a dynamically instrumented system trace tool to debug, diagnose, and optimize system performance

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:

- PC running Red Hat Enterprise Linux 4

CHAPTER 2 *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 platform.

Prerequisites

This document is a guide to 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 PowerPC configuration and the lite5200 BSP have been installed on the development host. The user must:

1. Install the BlueCat Linux PowerPC 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 lite5200 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 lite5200 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 on the target board consists of the following main steps:

- Setting up hardware
- Setting up the board firmware (the Motorola dBUG firmware for the Lite5200 target or U-boot for the Lite5200B target)
- Downloading and booting a BlueCat Linux system from the target Flash memory or a network

Downloading and booting a BlueCat Linux system can be performed using either of the two OS boot loaders:

- The on-board firmware (dBUG or U-boot depending on the target)
- BlueCat Linux OS loader

The BlueCat Linux OS loader demo system currently includes the `osloader` Kernel Downloadable Image (KDI). `osloader` is the image with the base functionality of the BlueCat Linux OS loader configured in.

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

Connecting the Target Board Serial Port to the Host

The target board has one serial port. This port is used both by the target on-board firmware and by the BlueCat Linux system console.

The board type (Lite5200 or Lite5200B) is automatically detected by the BSP. Depending on a particular board, the serial port baud rate is 9600 for the Lite5200 target and 115200 for the Lite5200B target.

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

Connecting the Target Platform 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. The Ethernet port on the target 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 `<host_IP_address>` and `<target_IP_address>`, 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*.

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 either the on-board firmware or the BlueCat Linux OS loader. Refer also to the *BlueCat Linux User's Guide* for additional details about the BlueCat Linux OS loader.

Downloading a BlueCat Linux System into Flash Using the Motorola dBUG Firmware

To download a BlueCat Linux embedded system into the Lite5200 target Flash memory using the dBUG firmware, perform the steps below. This section uses the `osloader` demo system as an example, but these instructions are applicable to any of the demo systems.

1. Copy the `osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the development host:

   ```
   BlueCat:$ cp \
   $BLUECAT_PREFIX/demo/osloader/osloader.kdi \
   /tftpboot/osloader.kdi
   ```

2. Reset the target board.

3. At the dBUG prompt, enter the following commands:

```
dBUG> dn osloader.kdi
dBUG> fe ff000000 ff14ffff
```

   Type **YES** at the confirmation prompt.

```
dBUG> fp ff000000 ff14ffff 20000
```

As the result, the `osloader` demo is programmed into Flash.

To boot the `osloader` demo installed into the Flash memory, type the following command at the dBUG prompt:

```
dBUG> go ff000000
```

This command starts the `osloader` demo system programmed into Flash.

Downloading a BlueCat Linux System into Flash Using the U-Boot Firmware

To download a BlueCat Linux embedded system into the Lite5200B target Flash memory using the U-Boot firmware, perform the steps below. This section uses the `osloader` demo system as an example, but these instructions are applicable to any of the demo systems.

1. Copy the `osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the development host:

```
BlueCat:$ cp \
$BLUECAT_PREFIX/demo/osloader/osloader.kdi \
/tftpboot/osloader.kdi
```

2. Reset the target board.

3. At the U-Boot firmware prompt (=>), enter the following commands:

```
=> tftp 0x100000 osloader.kdi
=> erase ff000000 ff18ffff
=> cp 0x100000 ff000000 17fe00
```

   (where `17fe00` is the size of `osloader.kdi`)

As the result, the `osloader` demo is programmed into Flash.

To boot the `osloader` demo installed into the Flash memory, type the following command at the U-Boot prompt:

```
=> go ff007000
```

This command starts the `osloader` demo system programmed into Flash.

Downloading a BlueCat Linux System into Flash Using the OS Loader

To download a BlueCat Linux embedded system into the target Flash memory using the BlueCat OS loader, perform the steps below. This section uses the `osloader` demo system as an example, but these instructions are applicable to any of the demo systems.

1. Copy the `i_osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the development host:

   ```
   BlueCat:$ cp \
   $BLUECAT_PREFIX/demo/osloader/i_osloader.kdi \
   /tftpboot/i_osloader.kdi
   ```

2. Copy the `osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the development host:

   ```
   BlueCat:$ cp \
   $BLUECAT_PREFIX/demo/osloader/osloader.kdi \
   /tftpboot/osloader.kdi
   ```

3. Reset the target board.

4. Boot the `i_osloader` demo from a network as described in “Booting a BlueCat Linux System from a Network” on page 10. The BlueCat Linux OS loader prompt (>) appears on the console.

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

   ```
   > set IF eth0
   > set IP <target_board_IP>
   > set HOST <development_host_IP>
   > set FILE tftp osloader.kdi
   > exec flash_fdisk /dev/mtdchar0 0-23
   ```

```
> 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.

The partition size specified in the `flash_fdisk` command depends on the size of the system and should be large enough to hold the BlueCat Linux demo KDI. For the example above, the following calculation shows that a partition of size `0-23` is a correct parameter for the `osloader` demo system:

```
(23 - 0 +1)*64KB = 1536KB
```

where 64 KB is the size of the Flash sector. The calculated value 1536 KB is greater than the ROM requirement for the `osloader` demo (1367 KB). Refer to Chapter 4, “Supported Demo Systems” for details about the ROM requirements for all supported BlueCat Linux demo systems.

As the result, the `osloader` demo is programmed into Flash.

To boot the `osloader` demo installed into the Flash memory, type the following command at the firmware prompt:

```
go ff007000
```

This command starts the `osloader` demo system programmed into Flash.

Booting a BlueCat Linux System from a Network

A BlueCat Linux demo system can be booted from a network using either the on-board firmware or the BlueCat Linux OS loader.

Booting a BlueCat Linux System from a Network using the Motorola dBUG Firmware

The Motorola dBUG firmware uses the TFTP network protocol to load BlueCat Linux images over a network. To boot the `osloader` demo system over a network using the dBUG firmware, perform the following steps:

1. Copy the `osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the cross-development host.

   ```
   BlueCat:$ cp $BLUECAT_PREFIX/demo/osloader/\
   osloader.kdi /tftpboot/osloader.kdi
   ```

2. Reset the board.
3. To download the `osloader` demo image, execute the following command:

```
dBUG> dn -i osloader.kdi
Address:  0x00020000
Downloading Image 'osloader.kdi' from 172.17.0.1
.......................
1567745 bytes read via TFTP
```

4. To boot a BlueCat Linux system enter the `go` command as below:

```
dBUG> go
loaded at:     00800000 00951E00
zimage at:     00805E04 008F1EB8
initrd at:     008F5000 00951E00
avail ram:     00400000 00800000

Linux/PPC load: console=ttyPSC0 root=/dev/ram0 rw panic=25
ip=192.168.4.16 hda=bswap hdb=bswap hdc=bswap hdd=bswap root=101
Uncompressing Linux...done.
Now booting the kernel
Linux version 2.6.18.3 (bin@build4.tst) (gcc version 4.1.1) #3 Sun Jan
28 12:02:13 EST 2007
uboot_style_pci_init
Built 1 zonelists.  Total pages: 16384
Kernel command line: console=ttyPSC0 root=/dev/ram0 rw panic=25
ip=192.168.4.16 hda=bswap hdb=bswap hdc=bswap hdd=bswap roo1
PID hash table entries: 512 (order: 9, 2048 bytes)
Dentry cache hash table entries: 8192 (order: 3, 32768 bytes)
Inode-cache hash table entries: 4096 (order: 2, 16384 bytes)
Memory: 62444k available (1504k kernel code, 452k data, 112k init, 0k
highmem)
Mount-cache hash table entries: 512
NET: Registered protocol family 16
PCI: Probing PCI hardware
DMA: MPC52xx BestComm driver
MPC52xx BestComm inited
NET: Registered protocol family 2
IP route cache hash table entries: 512 (order: -1, 2048 bytes)
TCP established hash table entries: 2048 (order: 1, 8192 bytes)
TCP bind hash table entries: 1024 (order: 0, 4096 bytes)
TCP: Hash tables configured (established 2048 bind 1024)
TCP reno registered
io scheduler noop registered
io scheduler anticipatory registered
io scheduler deadline registered
io scheduler cfq registered (default)
Serial: MPC52xx PSC driver
ttyPSC0 at MMIO 0xf0002000 (irq = 40) is a MPC52xx PSC
RAMDISK driver initialized: 16 RAM disks of 8192K size 1024 blocksize
eth0: Phy @ 0x0, type LXT971 (0x001378e2)
Lite5200 Bank 0: Found 1 x8 devices at 0x0 in 8-bit bank
Lite5200 Bank 0: Found 1 x8 devices at 0x800000 in 8-bit bank
 Amd/Fujitsu Extended Query Table at 0x0040
Lite5200 Bank 0: CFI does not contain boot bank location. Assuming top.
number of CFI chips: 2
cfi_cmdset_0002: Disabling erase-suspend-program due to code
brokenness.
```

```
Lite5200 flash: registering 1 flash banks [FF000000 - FFFFFFFF = 16
Mbytes]
TCP bic registered
NET: Registered protocol family 1
NET: Registered protocol family 17
eth0: config: auto-negotiation on, 100HDX, 10HDX.
IP-Config: Guessing netmask 255.255.255.0
IP-Config: Complete:
      device=eth0, addr=192.168.4.16, mask=255.255.255.0,
gw=255.255.255.255,
     host=192.168.4.16, domain=, nis-domain=(none),
     bootserver=255.255.255.255, rootserver=255.255.255.255, rootpath=
,  boot file=
RAMDISK: Compressed image found at block 9172
Freeing BlueCat RFS memory: 371k freed
VFS: Mounted root (ext2 filesystem).
Freeing unused kernel memory: 112k init
BlueCat Loader Shell
```

Booting a BlueCat Linux System from a Network using the U-Boot Firmware

The U-Boot firmware uses the TFTP network protocol to load BlueCat Linux images over a network. To boot the `osloader` demo system over a network using the U-Boot firmware, perform the following steps:

1. Copy the `osloader.kdi` file from the `$BLUECAT_PREFIX/demo/osloader` directory to the `/tftpboot` directory on the cross-development host.

   ```
   BlueCat:$ cp $BLUECAT_PREFIX/demo/osloader/\
   osloader.kdi /tftpboot/osloader.kdi
   ```

2. Reset the board. The following information appears on the console:

   ```
   U-Boot 1.1.3 (Aug 10 2005 - 11:07:57)

   CPU:   MPC5200 v2.2 at 462 MHz
          Bus 132 MHz, IPB 132 MHz, PCI 33 MHz
   Board: Freescale MPC5200 (Lite5200B)
   I2C:   85 kHz, ready
   DRAM:  256 MB
   FLASH: 32 MB
   PCI:   Bus Dev VenId DevId Class Int
           00  1a  1057  5809  0680  00
   In:    serial
   Out:   serial
   Err:   serial
   Net:   FEC ETHERNET
   Hit any key to stop autoboot:  0
   =>
   ```

3. To download the `osloader` demo image, execute the following command:

```
=> tftp 0x100000 osloader.kdi
Using FEC ETHERNET device
TFTP from server 192.168.4.101; our IP address is 192.168.4.20
Filename 'osloader.kdi'.
Load address: 0x100000
Loading:
#################################################################
#################################################################
#################################################################
#################################################################
##############################################
done
Bytes transferred = 1572352 (17fe00 hex)
=>
```

4. To boot a BlueCat Linux system enter the go command as below:

```
=> go 0x107000
## Starting application at 0x00107000 ...
loaded at:     00800000 00951E00
zimage at:     00805E04 008F1EB8
initrd at:     008F5000 00951E00
avail ram:     00400000 00800000

Linux/PPC load: console=ttyPSC0 root=/dev/ram0 rw panic=25
ip=192.168.4.16 hda=bswap hdb=bswap hdc=bswap hdd=bswap root=101
Uncompressing Linux...done.
Now booting the kernel
Linux version 2.6.18.3 (bin@build4.tst) (gcc version 4.1.1) #3 Sun Jan
28 12:02:13 EST 2007
uboot_style_pci_init
Built 1 zonelists.  Total pages: 16384
Kernel command line: console=ttyPSC0 root=/dev/ram0 rw panic=25
ip=192.168.4.16 hda=bswap hdb=bswap hdc=bswap hdd=bswap roo1
PID hash table entries: 512 (order: 9, 2048 bytes)
Dentry cache hash table entries: 8192 (order: 3, 32768 bytes)
Inode-cache hash table entries: 4096 (order: 2, 16384 bytes)
Memory: 62444k available (1504k kernel code, 452k data, 112k init, 0k
highmem)
Mount-cache hash table entries: 512
NET: Registered protocol family 16
PCI: Probing PCI hardware
DMA: MPC52xx BestComm driver
MPC52xx BestComm inited
NET: Registered protocol family 2
IP route cache hash table entries: 512 (order: -1, 2048 bytes)
TCP established hash table entries: 2048 (order: 1, 8192 bytes)
TCP bind hash table entries: 1024 (order: 0, 4096 bytes)
TCP: Hash tables configured (established 2048 bind 1024)
TCP reno registered
io scheduler noop registered
io scheduler anticipatory registered
io scheduler deadline registered
io scheduler cfq registered (default)
Serial: MPC52xx PSC driver
ttyPSC0 at MMIO 0xf0002000 (irq = 40) is a MPC52xx PSC
RAMDISK driver initialized: 16 RAM disks of 8192K size 1024 blocksize
eth0: Phy @ 0x0, type LXT971 (0x001378e2)
```

```
Lite5200 Bank 0: Found 1 x8 devices at 0x0 in 8-bit bank
Lite5200 Bank 0: Found 1 x8 devices at 0x800000 in 8-bit bank
 Amd/Fujitsu Extended Query Table at 0x0040
Lite5200 Bank 0: CFI does not contain boot bank location. Assuming top.
number of CFI chips: 2
cfi_cmdset_0002: Disabling erase-suspend-program due to code
brokenness.
Lite5200 flash: registering 1 flash banks [FF000000 - FFFFFFFF = 16
Mbytes]
TCP bic registered
NET: Registered protocol family 1
NET: Registered protocol family 17
eth0: config: auto-negotiation on, 100HDX, 10HDX.
IP-Config: Guessing netmask 255.255.255.0
IP-Config: Complete:
      device=eth0, addr=192.168.4.16, mask=255.255.255.0,
gw=255.255.255.255,
     host=192.168.4.16, domain=, nis-domain=(none),
     bootserver=255.255.255.255, rootserver=255.255.255.255, rootpath=
,  boot file=
RAMDISK: Compressed image found at block 9172
Freeing BlueCat RFS memory: 371k freed
VFS: Mounted root (ext2 filesystem).
Freeing unused kernel memory: 112k init
BlueCat Loader Shell
```

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

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

1. Copy the `showcase.kernel` and `showcase.rfs` files from the `$BLUECAT_PREFIX/demo/showcase` directory to the `/tftpboot` directory on the cross-development host.
2. Boot the OS loader as described in “Booting a BlueCat Linux System from a Network using the U-Boot Firmware” on page 12.
3. 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=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 `showcase` demo system from a network onto the target board and then automatically start it.

CHAPTER 3 *Kernel Configuration Options*

The Lite5200/Lite5200B 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 Lite5200/Lite5200B BSP Distribution” below. Boldfaced entries in the tables represent subordinate menus. Italicized entries represent comments.

Table 3-1: BlueCat Linux Default Configuration for the Lite5200/Lite5200B 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 3-6: “Processor”
Table 3-7: “Platform Options”
Table 3-8: “Bus Options”
Table 3-9: “Advanced Setup”
Table 3-10: “Networking”
Table 3-11: “Device Drivers”
Table 3-12: “File Systems”
Table 3-13: “MPC52xx CPM Options”
Table 3-14: “Library Routines”
Table 3-15: “Profiling Support”
Table 3-16: “Kernel Hacking”

Table 3-1: BlueCat Linux Default Configuration for the Lite5200/Lite5200B BSP Distribution (Continued)

Table Number and Configuration Parameter
Table 3-17: “Security Options”
Table 3-18: “Cryptographic Options”

Table 3-2: Code Maturity Level Options

Description	Setting
Prompt for development and/or incomplete code/drivers	Y

Table 3-3: General Setup

Description	Setting
Local version—append to kernel release	is not set
Automatically append version information to the version string	Y
Support for paging of anonymous memory (swap)	Y
System V IPC	Y
POSIX message queues	is not set
BlueCat Linux OS loader support	is not set
Memory sizing benchmarks	is not set
BSD process accounting	is not set
Export task/process statistics through netlink (Experimental)	is not set
Auditing support	is not set
Kernel `.config` support	is not set
Kernel->user space relay support (formerly relayfs)	is not set
Initramfs source file(s)	is not set
Optimize for size (Look out for broken compilers!)	is not set
Configure standard kernel features (for small systems)	Y

Table 3-3: General Setup (Continued)

Description	Setting
CODETEST device driver configuration	is not set
Use full `shmem` file system	Y
Use full SLAB allocator	Y
Enable VM event counters for `/proc/vmstat`	Y

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	Y
Source checksum for all modules	is not set
Automatic kernel module loading	Y

Table 3-5: Block Layer

Description	Setting
Support for Large Block Devices	is not set
Support for tracing block I/O actions	is not set
Support for Large Single Files	is not set
IO Schedulers	
Anticipatory I/O scheduler	Y
Deadline I/O scheduler	Y
CFQ I/O scheduler	Y
Default I/O scheduler (CFQ)	

Table 3-5: Block Layer (Continued)

Description	Setting
Anticipatory	is not set
Deadline	is not set
CFQ	Y
No-op	is not set

Table 3-6: Processor

Description	Setting
Processor Type (6xx/7xx/74xx/52xx/82xx/83xx)	
6xx/7xx/74xx/52xx/82xx/83xx	Y
40x	is not set
44x	is not set
8xx	is not set
e200	is not set
e500	is not set
AltiVec support	is not set
Thermal Management support	is not set
`kexec` system call (Experimental)	Y
CPU frequency scaling	is not set
IRQ to user delivery	Y

Table 3-7: Platform Options

Description	Setting
Platform options	
Machine Type (Freescale Lite5200 / (IceCube))	

Table 3-7: Platform Options (Continued)

Description	Setting
CHRP/PowerMac/PReP	is not set
Artesyn Katana	is not set
Cogent Willow	is not set
Force CPCI690	is not set
Force PowerCore	is not set
Force PowerPMC250	is not set
IBM 750FX Eval board or 750GX Eval board	is not set
IBM Spruce	is not set
Sky HDPU	is not set
Marvell EV64260BP	is not set
Motorola LoPEC	is not set
Motorola MCPN765	is not set
Motorola MVME5100	is not set
Motorola PowerPlus	is not set
Motorola PrPMC750	is not set
Motorola PrPMC800	is not set
Motorola Sandpoint	is not set
Radstone Technology PPC7D board	is not set
SBS Adirondack	is not set
SBS K2	is not set
SBS Palomar4	is not set
EST8260	is not set
SBC82xx	is not set
RPXSUPER	is not set
TQM8260	is not set
ADS8272	is not set
Freescale PQ2FADS	is not set

Table 3-7: Platform Options (Continued)

Description	Setting
Freescale Lite5200/(IceCube)	Y
Freescale MPC834x SYS	is not set
Freescale Lite5200B	Y
Symmetric multiprocessing support	is not set
High memory support	is not set
Timer frequency (250 HZ)	
100 HZ	is not set
250 HZ	Y
1000 HZ	is not set
Preemption Model (No Forced Preemption (Server))	
No Forced Preemption (server)	is not set
Voluntary Kernel Preemption (desktop)	is not set
Preemptible Kernel (low-latency desktop)	Y
Preempt the Big Kernel Lock	Y
Memory model (Flat Memory)	
Flat Memory	Y
64-bit Memory and IO resources (Experimental)	is not set
Kernel support for ELF binaries	Y
Kernel support for MISC binaries	is not set
Default bootloader kernel arguments	Y
Initial kernel command string	`console=ttyPSC0 root=/dev/ram rwpanic=25`
Power Management support	is not set
Enable seccomp to safely compute untrusted bytecode	Y

Table 3-8: Bus Options

Description	Setting
PCI support	Y
PCCARD (PCMCIA/CardBus) support	is not set

Table 3-9: Advanced Setup

Description	Setting
Prompt for advanced kernel configuration options	is not set
--- *Default settings for advanced configuration options are used.*	

Table 3-10: Networking

Description	Setting
Networking support	Y
Networking options	
Network packet debugging	is not set
Packet socket	Y
Packet socket: mmapped IO	is not set
UNIX domain sockets	Y
IPsec user configuration interface	is not set
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	Y
IP: DHCP support	is not set

Table 3-10: Networking (Continued)

Description	Setting
IP: BOOTP support	is not set
IP: RARP support	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 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
IP: IPsec transport mode	Y
IP: IPsec tunnel mode	Y
INET: socket monitoring interface	Y
TCP: advanced congestion control	is not set
The IPv6 protocol	is not set
Security Marking	is not set
Network packet filtering (replaces ipchains)	is not set
DCCP Configuration (Experimental)	is not set
The DCCP protocol (Experimental)	is not set
SCTP Configuration (Experimental)	is not set
The SCTP protocol (Experimental)	is not set
TIPC Configuration (Experimental)	
The TIPC 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

Table 3-10: Networking (Continued)

Description	Setting
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
Acorn Econet/AUN protocols (Experimental)	is not set
WAN router	is not set
QoS and/or fair queueing	
QoS and/or fair queueing	is not set
Network testing	is not set
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
Generic IEEE 802.11 networking stack	is not set

Table 3-11: Device Drivers

Description	Settings
Generic Driver Options	
Select only drivers that don't need compile-time external firmware?	Y
Prevent firmware from being built	Y
Connector - unified userspace <-> kernelspace linker	
Connector - unified userspace <-> kernelspace linker	is not set
Memory Technology Devices	

Table 3-11: Device Drivers (Continued)

Description	Settings
Memory Technology Device (MTD) support	Y
Debugging	is not set
MTD concatenating support	is not set
MTD partitioning support	Y
RedBoot partition table parsing	is not set
Command line partition table parsing	is not set
--- *User Modules And Translation Layers*	
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
Resident Flash Disk (Flash Translation Layer) 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	is not set
Support for AMD/Fujitsu Flash chips	Y
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	Y
CFI Flash device in physical memory map	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
CFI Flash device mapped for Motorola Lite5200	Y
Total Flash size	0x02000000
PCI MTD driver	is not set
Map driver for platform device RAM (mtd-ram)	is not set
Self-contained MTD device drivers	
Ramix PMC551 PCI Mezzanine RAM card support	is not set
Uncached system RAM	is not set
Physical system RAM	is not set
Test driver using RAM	is not set
MTD using block device	is not set
--- *Disk-On-Chip Device Drivers*	
M-Systems Disk-On-Chip 2000 and Millennium (Deprecated)	is not set
M-Systems Disk-On-Chip Millennium-only alternative driver (Deprecated)	is not set
M-Systems Disk-On-Chip Millennium Plus	is not set
NAND Flash Device Drivers	
NAND device support	is not set
OneNAND Flash Device Drivers	
OneNAND Flash device drivers	is not set
Parallel port support	
Parallel port support	is not set
Plug and Play support	is not set
Block Devices	is not set
Normal floppy disk support	is not set
Compaq SMART-2 support	is not set
Compaq Smart Array 5xxx support	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
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
Low Performance USB Block driver	is not set
RAM disk support	Y
Default number of RAM disks	16
Default RAM disk size	8192
Default RAM disk block size (bytes)	1024
Initial RAM disk (`initrd`) support	is not set
BlueCat Linux RFS support	Y
Packet writing on CD-ROM/DVD media	is not set
ATA over Ethernet support	is not set
ATA/ATAPI/MFM/RLL support	
ATA/ATAPI/MFM/RLL support	is not set
SCSI device support	is not set
RAID Transport Class	is not set
--- *SCSI device support*	
legacy `/proc/scsi/` support	Y
--- *SCSI support type (disk, tape, CD-ROM)*	
SCSI disk support	Y
SCSI tape support	is not set
SCSI tape support	is not set
SCSI OnStream SC-x0 tape support	is not set
SCSI CD-ROM support	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
SCSI generic support	is not set
SCSI media changer support	is not set
--- *Some SCSI devices (e.g., CD jukebox) support multiple LUNs*	
Probe all LUNs on each SCSI device	is not set
Verbose SCSI error reporting (kernel size +=12K)	is not set
SCSI logging facility	is not set
SCSI Transport Attributes	
Parallel SCSI (SPI) Transport Attributes	is not set
FiberChannel Transport Attributes	is not set
iSCSI Transport Attributes	is not set
SAS Transport Attributes	is not set
SCSI low-level drivers	
iSCSI Initiator over TCP/IP	is not set
3ware 5/6/7/8xxx ATA-RAID support	is not set
3ware 9xxx SATA-RAID support	is not set
ACARD SCSI support	is not set
Adaptec AACRAID support	is not set
Adaptec AIC7xxx Fast -> U160 support (new driver)	is not set
Adaptec AIC7xxx support (old driver)	is not set
Adaptec AIC79xx U320 support	is not set
Adaptec I2O RAID support	is not set
LSI Logic New Generation RAID Device Drivers	is not set
LSI Logic Legacy MegaRAID Driver	is not set
LSI Logic MegaRAID SAS RAID Module	is not set
Serial ATA (SATA) support	is not set
HighPoint RocketRAID 3xxx Controller support	is not set
BusLogic SCSI support	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
DMX3191D SCSI support	is not set
EATA ISA/EISA/PCI (DPT and generic EATA/DMA-compliant boards) support	is not set
Future Domain 16xx SCSI/AHA-2920A support	is not set
Intel/ICP (former GDT SCSI Disk Array) RAID Controller support	is not set
IBM ServeRAID support	is not set
Initio 9100U(W) support	is not set
Initio INI-A100U2W support	is not set
SYM53C8XX Version 2 SCSI support	is not set
IBM Power Linux RAID Adapter support	is not set
Qlogic QLA 1240/1x80/1x160 SCSI support	is not set
QLogic QLA2XXX Fibre Channel support	is not set
Emulex LightPulse Fibre Channel support	is not set
Tekram DC395(U/UW/F) and DC315(U) SCSI support (Experimental)	is not set
Tekram DC390(T) and Am53/79C974 SCSI support	is not set
Workbit NinjaSCSI-32Bi/UDE support	is not set
SCSI debugging host simulator	is not set
Multiple device support (RAID and LVM)	
Multiple devices driver support (RAID and LVM)	is not set
Fusion MPT device support	
Fusion MPT ScsiHost drivers for SPI	is not set
Fusion MPT ScsiHost drivers for FC	is not set
Fusion MPT ScsiHost drivers for SAS	is not set
IEEE 1394 (FireWire) support	
IEEE 1394 (FireWire) support	is not set
I2O device support	

Table 3-11: Device Drivers (Continued)

Description	Settings
I2O support	is not set
Macintosh device drivers	is not set
New PowerMac thermal control infrastructure	is not set
Networking device support	
Networking 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
ARCnet devices	
ARCnet support	is not set
PHY device support	
PHY device support and infrastructure	is not set
IBM On-chip net device	is not set
Ethernet (10 or 100Mbit)	
Ethernet (10 or 100 Mbit)	Y
--- *Generic Media Independent Interface device support*	
Sun Happy Meal 10/100baseT support	is not set
Sun GEM support	Y
Sun Cassini 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

Table 3-11: Device Drivers (Continued)

Description	Settings
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	is not set
nForce Ethernet support	is not set
Digi Intl. RightSwitch SE-X support	is not set
EtherExpressPro/100 support (eepro100, original Becker driver)	is not set
Intel PRO/100+ support	Y
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-8129/8130/8139 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
MPC5200 Networking Options	
FEC Ethernet	Y
Use external Ethernet MII PHY	Y
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

Table 3-11: Device Drivers (Continued)

Description	Settings
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
SiS190/SiS191 Gigabit Ethernet support	is not set
New SysKonnect GigaEthernet support (Experimental)	is not set
SysKonnect Yukon2 support (Experimental)	is not set
Marvell Yukon Chipset/SysKonnect SK-98xx support	is not set
VIA Velocity support	is not set
Broadcom Tigon3 support	is not set
Broadcom NetXtremeII support	is not set
Ethernet (10000 Mbit)	is not set
Chelsio 10 Gb Ethernet support	is not set
Intel PRO/10GbE support	is not set
S2IO 10Gbe XFrame NIC	is not set
Myricom Myri-10G Ethernet support	is not set
Token Ring devices	
Token Ring driver support	is not set
Wireless LAN (non-ham radio)	
Wireless LAN drivers (non-ham radio) and wireless extensions	is not set
WAN interfaces	is not set
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

Table 3-11: Device Drivers (Continued)

Description	Settings
Fibre Channel driver support	is not set
Traffic Shaper (Experimental)	is not set
Network console logging support (Experimental)	is not set
ISDN subsystem	
ISDN support	is not set
Telephony Support	
Linux telephony support	is not set
Input device support	
Generic input layer (needed for keyboard, mouse, ...)	is not set
Hardware I/O ports	
Serial I/O support	is not set
Gameport support	is not set
Character devices	
Virtual terminal	is not set
nonstandard serial port support	is not set
Serial drivers	
8250/16550 and compatible serial support	is not set
--- Non-8250 serial port support	
Freescale MPC52xx family PSC serial support	Y
Console on a Freescale MPC52xx family PSC serial port	Y
Freescale MPC52xx family PSC serial port baud	9600
Freescale MPC52xxB family PSC serial port baud	115200
Digi International NEO PCI support	is not set
Unix98 PTY support	Y
Legacy (BSD) PTY support	Y
Maximum number of legacy PTY in use	256

Table 3-11: Device Drivers (Continued)

Description	Settings
IPMI	
IPMI top-level message handler	is not set
Watchdog Cards	
Watchdog Timer support	Y
Disable watchdog shutdown on close	is not set
--- *Watchdog Device Drivers*	
Software watchdog	is not set
--- *PCI-based Watchdog Cards*	
Berkshire Products PCI-PC Watchdog	is not set
PCI-WDT500/501 Watchdog timer	is not set
--- *USB-based Watchdog Cards*	
Berkshire Products USB-PC Watchdog	is not set
Hardware Random Number Generator Core support	Y
`/dev/nvram` support	is not set
Generic `/dev/rtc` emulation	Y
Extended RTC operation	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	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
TPM devices	
TPM hardware support	is not set
Telecom clock driver for MPBL0010 ATCA SBC	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
I2C support	
I2C support	Y
I2C device interface	Y
I2C Algorithms	
I2C bit-banging interfaces	is not set
I2C PCF 8584 interfaces	is not set
I2C PCA 9564 interfaces	is not set
I2C Hardware Bus support	
ALI 1535	is not set
ALI 1563	is not set
ALI 15x3	is not set
AMD 756/766/768/8111 and NVIDIA nForce	is not set
AMD 8111	is not set
Intel 82801 (ICH)	is not set
Intel 810/815	is not set
Intel PIIX4	is not set
MPC107/824x/85xx/52xx	Y
NVIDIA nForce2, nForce3, and nForce4	is not set
OpenCores I2C Controller	is not set
Parallel port adapter (light)	is not set
S3/VIA (Pro)Savage	is not set
S3 Savage 4	is not set
SiS 5595	is not set
SiS 630/730	is not set
SiS 96x	is not set
I2C/SMBus Test Stub	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
VIA 82C586B	is not set
VIA 82C596/82C686/823x	is not set
Voodoo 3	is not set
PCA9564 on an ISA bus	is not set
Miscellaneous I2C Chip support	
Dallas Semiconductor DS1337 and DS1339 Real Time Clock	is not set
Maxim/Dallas Semiconductor DS1374 Real Time Clock	is not set
EEPROM reader	Y
Philips PCF8574 and PCF8574A	is not set
Philips PCA9539 16-bit I/O port	is not set
Philips PCF8591	is not set
ST M41T00 RTC chip	is not set
Maxim MAX6875 Power Supply Supervisor	is not set
I2C Core debugging messages	is not set
I2C Algorithm debugging messages	is not set
I2C Bus debugging messages	is not set
I2C Chip debugging messages	is not set
SPI support	
SPI support	is not set
Dallas's 1-wire support	is not set
Hardware Monitoring support	
Hardware Monitoring support	Y
Analog Devices ADM1021 and compatibles	is not set
Analog Devices ADM1025 and compatibles	is not set
Analog Devices ADM1026 and compatibles	is not set
Analog Devices ADM1031 and compatibles	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
Analog Devices ADM9240 and compatibles	is not set
Asus ASB100 Bach	is not set
Attansic ATXP1 VID controller	is not set
Dallas Semiconductor DS1621 and DS1625	is not set
Fintek F71805F/FG	is not set
FSC Hermes	is not set
FSC Poseidon	is not set
Genesys Logic GL518SM	is not set
Genesys Logic GL520SM	is not set
ITE IT87xx and compatibles	is not set
National Semiconductor LM63	is not set
National Semiconductor LM75 and compatibles	is not set
National Semiconductor LM77	is not set
National Semiconductor LM78 and compatibles	is not set
National Semiconductor LM80	is not set
National Semiconductor LM83	is not set
National Semiconductor LM85 and compatibles	is not set
National Semiconductor LM87	is not set
National Semiconductor LM90 and compatibles	is not set
National Semiconductor LM92 and compatibles	is not set
Maxim MAX1619 sensor chip	is not set
National Semiconductor PC87360 family	is not set
Silicon Integrated Systems Corp. SiS5595	is not set
SMSC LPC47M10x and compatibles	is not set
SMSC LPC47B397-NC	is not set
VIA686A	is not set
VT8231	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
Winbond W83781D, W83782D, W83783S, W83627HF, Asus AS99127F	is not set
Winbond W83L785TS-S	is not set
Winbond W83627HF, W83627THF, W83637HF, W83697HF	is not set
Winbond W83627EHF	is not set
Hardware Monitoring Chip debugging messages	is not set
Misc devices	is not set
Multimedia devices	
Video for Linux	is not set
Digital Video Broadcasting Devices	is not set
DVB for Linux	is not set
DABUSB driver	is not set
Graphics support	
Enable firmware EDID	Y
Support for frame buffer devices	is not set
Backlight & LCD device support	is not set
Sound	
Sound card support	is not set
USB support	
Support for host-side USB	Y
USB verbose debug messages	is not set
--- *Miscellaneous USB options*	
USB device file system	is not set
Enforce USB bandwidth allocation (Experimental)	is not set
Dynamic USB minor allocation (Experimental)	is not set
--- *USB Host Controller Drivers*	

Table 3-11: Device Drivers (Continued)

Description	Settings
EHCI HCD (USB 2.0) support	is not set
ISP116X HCD support	is not set
OHCI HCD support	Y
OHCI support for on-chip PPC USB controller	Y
OHCI support for PCI-bus USB controllers	is not set
UHCI HCD (most Intel and VIA) support	is not set
SL811HS HCD support	is not set
--- *USB Device Class drivers*	
USB modem (CDC ACM) support	is not set
USB printer support	is not set
-- *NOTE: USB_STORAGE enables SCSI, and 'SCSI disk support' may also be needed.*	
USB Mass Storage support	Y
USB Mass Storage verbose debug	is not set
Datafab Compact Flash Reader support (Experimental)	is not set
Freecom USB/ATAPI Bridge support	is not set
Microtech/ZiO! CompactFlash/SmartMedia support	is not set
USBAT/USBAT02-based storage support (Experimental)	is not set
SanDisk SDDR-09 (and other SmartMedia) support (Experimental)	is not set
SanDisk SDDR-55 SmartMedia support (Experimental)	is not set
Lexar Jumpshot Compact Flash Reader (Experimental)	is not set
Olympus MAUSB-10/Fuji DPC-R1 support (Experimental)	is not set
Support OneTouch Button on Maxtor Hard Drives (Experimental)	is not set
The shared table of common (or usual) storage devices	is not set
--- *USB Input Devices*	
USB Human Interface Device (full HID) support	is not set
USB HID Boot Protocol drivers	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
--- *USB Imaging devices*	
USB Mustek MDC800 Digital Camera support (Experimental)	is not set
Microtek X6USB scanner support	is not set
USB Network Adapters	
USB CATC NetMate-based Ethernet device support (Experimental)	is not set
USB KLSI KL5USB101-based Ethernet device support	is not set
USB Pegasus/Pegasus-II-based Ethernet device support	is not set
USB RTL8150-based Ethernet device support (Experimental)	is not set
Multipurpose USB Networking Framework	is not set
USB Monitor	Y
--- *USB port drivers*	
USB Serial Converter support	
USB Serial Converter support	is not set
--- *USB Miscellaneous drivers*	
EMI 6|2m USB Audio interface support	is not set
EMI 2|6 USB Audio interface support	is not set
USB Auerswald ISDN support (Experimental)	is not set
USB Diamond Rio500 support (Experimental)	is not set
USB Lego Infrared Tower support (Experimental)	is not set
USB LCD driver support	is not set
USB LED driver support	is not set
Cypress CY7C63xxx USB driver support	is not set
Cypress USB thermometer driver support	is not set
USB PhidgetKit support	is not set
USB PhidgetServo support	is not set
Siemens ID USB Mouse Fingerprint sensor support	is not set

Table 3-11: Device Drivers (Continued)

Description	Settings
USB LD driver	is not set
USB DSL modem support	is not set
USB Gadget Support	is not set
Support for USB Gadgets	is not set
MMC/SD Card support	
MMC support	is not set
LED support	
LED support	is not set
--- *LED drivers*	
--- *LED Triggers*	
InfiniBand support	
InfiniBand support	is not set
EDAC error detection and reporting (RAS) (Experimental)	is not set
Real Time Clock	
RTC class	is not set
DMA Engine support	
Support for DMA engines	is not set
--- *DMA Clients*	
--- *DMA Devices*	
CAN Support	
CAN (Controller Area Network) support	Y
MSCAN support	Y
Debugging support for MSCAN driver	is not set

Table 3-12: File Systems

Description	Setting
Second extended file system support	Y
Ext2 extended attributes	Y
Ext2 POSIX Access Control Lists	is not set
Ext2 Security Labels	is not set
Ext2 execute in place support	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
OCFS2 file system support (Experimental)	is not set
Minix file system support	is not set
ROM file system support	is not set
Inotify file change notification support	Y
Inotify support for userspace	Y
Quota support	is not set
Dnotify support	Y
Kernel automounter support	is not set
Kernel automounter version 4 support (also supports v3)	is not set
File system in Userspace support	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	
MS-DOS file system support	is not set
VFAT (Windows-95) file system support	is not set

Table 3-12: File Systems (Continued)

Description	Setting
NTFS file system support	is not set
Pseudo File Systems	
`/proc` file system support	Y
`/proc/kcore` support	is not set
`sysfs` file system support	Y
Virtual memory file system support (former `shm` file system)	is not set
Userspace-driven configuration file system (Experimental)	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
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
JFFS stats available in `/proc` file system	is not set
Journalling Flash File System v2 (JFFS2) support	Y
JFFS2 debugging verbosity (0 = quiet, 2 = noisy)	0
JFFS2 write-buffering support	is not set
JFFS2 summary support (Experimental)	is not set
JFFS2 XATTR support (Experimental)	is not set
Advanced compression options for JFFS2	is not set
Compressed ROM file system support	is not set
FreeVxFS file system support (VERITAS VxF-compatible)	is not set
OS/2 HPFS file system support	is not set

Table 3-12: 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	Y
Provide NFSv3 client support	Y
Provide client support for the NFSv3 ACL protocol extension	is not set
Provide NFSv4 client support (Experimental)	is not set
Allow direct I/O on NFS files (Experimental)	is not set
NFS server support	is not set
Root file system on NFS	Y
Secure RPC: Kerberos V mechanism (Experimental)	is not set
Secure RPC: SPKM3 mechanism (Experimental)	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
Andrew File System (AFS) support (Experimental)	is not set
Plan 9 Resource Sharing Support (9P2000) (Experimental)	is not set
Partition Types	
Advanced partition selection	is not set
Native Language Support	
Base native language support	Y
Default NLS Option	iso8859-1
Codepage 437 (United States, Canada)	is not set
Codepage 737 (Greek)	is not set

Table 3-12: File Systems (Continued)

Description	Setting
Codepage 775 (Baltic Rim)	is not set
Codepage 850 (Europe)	is not set
Codepage 852 (Central/Eastern Europe)	is not set
Codepage 855 (Cyrillic)	is not set
Codepage 857 (Turkish)	is not set
Codepage 860 (Portuguese)	is not set
Codepage 861 (Icelandic)	is not set
Codepage 862 (Hebrew)	is not set
Codepage 863 (Canadian French)	is not set
Codepage 864 (Arabic)	is not set
Codepage 865 (Norwegian, Danish)	is not set
Codepage 866 (Cyrillic/Russian)	is not set
Codepage 869 (Greek)	is not set
Simplified Chinese character set (CP936, GB2312)	is not set
Traditional Chinese character set (Big5)	is not set
Japanese character sets (Shift-JIS, EUC-JP	is not set
Korean character set (CP949, EUC-KR)	is not set
Thai character set (CP874, TIS-620)	is not set
Hebrew character sets (ISO-8859-8, CP1255)	is not set
Windows CP1250 (Slavic/Central European Languages)	is not set
Windows CP1251 (Bulgarian, Belarusian)	is not set
ASCII (United States)	is not set
NLS ISO 8859-1 (Latin 1; Western European Languages)	M
NLS ISO 8859-2 (Latin 2; Slavic/Central European Languages)	is not set
NLS ISO 8859-3 (Latin 3; Esperanto, Galician, Maltese, Turkish)	is not set
NLS ISO 8859-4 (Latin 4; old Baltic character set)	is not set
NLS ISO 8859-5 (Cyrillic)	is not set

Table 3-12: File Systems (Continued)

Description	Setting
NLS ISO 8859-6 (Arabic)	is not set
NLS ISO 8859-7 (Modern Greek)	is not set
NLS ISO 8859-9 (Latin 5; Turkish)	is not set
NLS ISO 8859-13 (Latin 7; Baltic)	is not set
NLS ISO 8859-14 (Latin 8; Celtic)	is not set
NLS ISO 8859-15 (Latin 9; Western European Languages with Euro)	is not set
NLS KOI8-R (Russian)	is not set
NLS KOI8-U/RU (Ukrainian, Belarusian)	is not set
NLS UTF8	is not set

Table 3-13: MPC52xx CPM Options

Description	Setting
Support for MPC52xx GPIO control	Y

Table 3-14: Library Routines

Description	Setting
CRC-CCITT functions	is not set
CRC16 functions	is not set
--- *CRC32 functions*	
CRC32c (Castagnoli et al.) Cyclic Redundancy-Check	is not set

Table 3-15: Profiling Support

Description	Setting
Profiling support (Experimental)	is not set

Table 3-16: Kernel Hacking

Description	Setting
Show timing information on printks	is not set
Magic SysRq key	is not set
Enable unused/obsolete exported symbols	is not set
Kernel debugging	is not set
Debug file system	is not set
BlueCat Linux kernel debugger	is not set
Support for early boot texts over serial port	is not set

Table 3-17: Security Options

Description	Setting
Enable access key retention support	is not set
Enable different security models	is not set

Table 3-18: Cryptographic Options

Description	Setting
Cryptographic API	is not set
Hardware crypto devices	is not set

CHAPTER 4 *Supported Demo Systems*

This chapter provides information about BlueCat Linux demo systems supported by the lite5200 BSP.

Demo Systems

Table 4-1 lists the demo systems supported in the lite5200 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 lite5200 BSP

Demo	Boot Devices Supported by Default	ROM Requirements	RAM Requirements
`developer`	Network (using on-board firmware) Network (using BlueCat Linux OS loader) ROM/Flash (using on-board firmware) ROM/Flash (using BlueCat Linux OS loader)	6.1 MB	29 MB
`osloader`	Network (using on-board firmware) ROM/Flash (using on-board firmware)	1.4 MB	8.3 MB
`showcase`	Network (using on-board firmware) Network (using BlueCat Linux OS loader) ROM/Flash (using on-board firmware) ROM/Flash (using BlueCat Linux OS loader)	4 MB	17.5 MB

developer Demo System

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

CHAPTER 5 *Supported Device Drivers*

Table 5-1 lists the device drivers supported by the lite5200 BSP and provides important information about them.

Table 5-1: Device Drivers Supported by the lite5200 BSP

Hardware Device	Device Drivers	Location in Source Tree	Kernel Configuration Options

MPC52xx PSC	`mpc52xx_uart.c`	`drivers/serial`	`CONFIG_SERIAL_CORE`
			`CONFIG_SERIAL_MPC52xx`
			`CONFIG_SERIAL_MPC52xx_CONSOLE`

Fast Ethernet Controller	`fec.c`	`drivers/net/fec_mpc52xx`	`CONFIG_FEC_MPC52xx` `CONFIG_USE_MDIO`
BestComm DMA Controller	`sdma.c`	`arch/ppc/syslib/bestcomm/`	`CONFIG_PPC_BESTCOMM`
CAN Controller	`*.c`	`drivers/pcan`	`CONFIG_CAN_BUS` `CONFIG_PCAN_MPC5200`

Flash Memory	`lite5200.c`	`drivers/mtd/maps`	`CONFIG_MTD`
			`CONFIG_MTD_PARTITIONS`
			`CONFIG_MTD_COMPLEX_MAPPING`
			`CONFIG_MTD_CFI`
			`CONFIG_MTD_CFI_AMDSTD`
			`CONFIG_MTD_LITE5200`
			`CONFIG_MTD_LITE5200_LEN`

I^2C	`i2c-mpc.c`	`drivers/i2c/busses`	`CONFIG_I2C` `CONFIG_I2C_MPC`
USB	`ohci-*.c`	`drivers/usb/host`	`CONFIG_USB` `CONFIG_USB_OHCI_HCD`
User space IRQ delivery	`irq.c`	`arch/ppc`	`CONFIG_USER_IRQ` `CONFIG_SYSCTL`

Table 5-1: Device Drivers Supported by the lite5200 BSP (Continued)

Hardware Device	Device Drivers	Location in Source Tree	Kernel Configuration Options
GPIO	gpio.c	arch/ppc/5xxx_io	CONFIG_GPIO
PCI	mpc52xx_pci.c mpc52xx_pci_ub.c	arch/ppc/syslib	CONFIG_PCI

CHAPTER 6 *Known Problems and Limitations*

This chapter describes known problems and limitations of this release.

Lite5200/Lite5200B Target Board Problems and Limitations

The following are known problems and limitations of this release:

- The `sed` target RPM fails to build on a slow machine. As a workaround, install the `sed-4.1.5-5.src.rpm` package and edit the `sed_trg.spec` file by adding the following line between line 55 (`%configure...`) and line 56 (`make`):

  ```
  touch doc/sed.1
  ```

  Run the `rpmbuild -ba` command.

- The `nfs-utils` target RPM fails to build. As workaround, install the `libgssapi` package from the Red Hat Enterprise Linux 4 distribution on the development host.

- Debugging of a multithreaded application does not work as expected after restarting the application.

Resolved BlueCat Linux 5.4 Issues

The following improvements are made in this release of BlueCat Linux comparatively to the previous releases of BlueCat Linux for Lite5200/5200B:

- Standard Linux MTD `ioctl()` commands are supported.

- JFFS2 problems related to a nonaligned access to the Flash memory are resolved.
- The defect in `mkrootfs` that result in creating incorrect JFFS2 images is fixed.
- The redundant per-partition MTD block device threads are removed.
- The MTD-related kernel code is cleaned up.
- Read-only Flash partitions are supported in this release of BlueCat Linux.