

BlueCat Linux Target Support Guide

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For Intel IQ80310 Evaluation Boards

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This *Target Support Guide* (TSG) provides information about the BlueCat Linux Target Support Package (TSP) for Intel IQ80310 evaluation boards.

Throughout this Target Support Guide (TSG), the TSP is referred to as the “IQ80310,” the board as the “IQ80310 evaluation board,” or simply as the “target board.”

- **Chapter 1** is an overview of the TSG’s individual chapters.
- **Chapter 2** describes the download and boot procedure for BlueCat Linux on the target IQ80310 board, using the `apache` demo system as an example.
- **Chapter 3** details configuration of the prebuilt BlueCat Linux kernel contained in the IQ80310 TSP.
- **Chapter 4** in this guide lists the BlueCat Linux demo systems supported by the IQ80310 TSP
- **Chapter 5** lists the device drivers in the IQ80310 TSP.
- **Chapter 6** describes BlueCat Linux-specific Application Programming Interfaces (APIs) for the IQ80310 evaluation board.

Downloading and Booting BlueCat Linux on the Target

This chapter provides instructions for booting a BlueCat Linux system on the Intel IQ80310 target board over a network.

Specifically, this chapter demonstrates downloading the BlueCat Linux OS loader (`i_osloader`) onto the target board, using the BlueCat Linux OS loader to download an Apache web server demo system onto the target board, and then starting up and running the `apache` demo system.

Prerequisites

This document is a guide to downloading and booting a BlueCat Linux system on the user's target board. Scenarios that use demo systems included in the BlueCat Linux distribution are presented. As such, the user is assumed to be familiar with the target board hardware and the manufacturer's documentation for it. The user must also have an understanding of system administration for the particular cross development host before BlueCat Linux and the IQ80310 Target Support Package (TSP) are installed.

Before installing and booting BlueCat Linux on an IQ80310 target board, it is assumed that the user has installed the BlueCat Linux XScale Binary Core and the IQ80310 TSP on the cross development host:

1. Install the BlueCat Linux XScale Binary Core on the cross development host, as described in the "Installing the Default Configuration" section in Chapter 1, "Installation" of the *BlueCat Linux User's Guide*
2. Install the IQ80310 TSP on the cross development host as described in the "Installing Support for Target Boards" section of Chapter 1, "Installation" in the *BlueCat Linux User's Guide*

3. Activate support for the IQ80310 target board as detailed in the “Activating Support for a Target Board” section of Chapter 1, “Installation” in the *BlueCat Linux User’s Guide*

Downloading and Booting Overview

A typical procedure for installing and booting a BlueCat Linux system on the IQ80310 target board consists of the following main steps:

- Setting up hardware
- Downloading the BlueCat Linux OS loader (`i_osloader`) to the IQ80310 target board
- Downloading and booting the demo system from flash or a network using the OS loader
- Starting up the Apache server in the demo system

Setting up Hardware

Connect the target board to the cross development host with two serial ports.

NOTE: *BlueCat Linux follows recommendations for mapping of the board UART ports to host ports, as proposed in the IQ80310 Board Manual. That is, the J9 connector is used for debugging from GDB. The J9 baud rate is 19200 or 115200, depending on the Cygmon firmware monitor version. When using RedBoot firmware, the J9 baud rate is 115200. The J10 port connector is used for the BlueCat Linux console; the J10 baud rate is 9600.*

Setting up BlueCat Linux OS Loader to Download a Demo System

This section and its subsections provide instructions for the process by which any of the demo systems in the BlueCat Linux TSP for IQ80310 boards can be downloaded into target flash memory using the BlueCat Linux OS loader (`i_osloader`). Refer also to the *BlueCat Linux User's Guide* for additional details about the BlueCat Linux OS loader.

Use the following procedure to download the BlueCat Linux OS loader (`i_osloader.elf`) into the IQ80310 flash memory using GDB.

1. On the cross development host, set up the BlueCat Linux development environment. (For further information on setting up BlueCat Linux, refer to the “Setting Up BlueCat Linux Execution Environment” section in the *BlueCat Linux User's Guide*)

```
$ cd $BLUECAT_PREFIX
```

```
$ . SETUP.sh iq80310
```

2. Go to the `osloader` demo system directory:

```
BlueCat:$ cd \  
$BLUECAT_PREFIX/demo/osloader
```

3. Start the cross GDB on the host. For example,

```
BlueCat:$ gdb -nw
```

4. Reset the IQ80310 target board by pressing the **Reset** button on the mother board, and connect GDB to the target board:

```
(gdb) set remotebaud 115200
```

```
(gdb) target remote /dev/ttyS1
```

5. Download and start the BlueCat Linux OS loader on the target board:

```
(gdb) load i_osloader.elf
```

```
(gdb) continue
```

The kernel will boot up and the BlueCat Linux OS loader shell (BLOSH) prompt (>) will appear on the system console (J10 connector).

NOTE: *The `i_osloader.elf` file is a GDB-downloadable image of the `i_osloader` demo system built specifically to aid in flash programming. In fact, a GDB-downloadable image can be constructed for any demo system, if necessary.*

```
Command line:
Uncompressing Linux...done.
.....
Freeing unused kernel memory: 4k init
BlueCat Loader Shell
>
```

Booting a Demo System on IQ80310 using the OS Loader

Once the BlueCat Linux OS loader has been downloaded into the IQ80310 target board, the user can boot an embedded system from a network or flash memory. The `apache` demo system is used in the example below to demonstrate booting a custom embedded system from both a network and flash. Refer to Chapter 4, “Supported Demo Systems” of this TSG for a description of `apache`.

Booting `apache` over a Network

The following example demonstrates booting the `apache` demo system from a TFTP server using the BlueCat Linux OS loader.

1. Set the environment variables to properly configure network access. For instance:

```
> set IP target_IP_address
> set HOST tftp_server_IP_address
> set IF eth0
```

2. Set the RFS and KERNEL variables so that they point to the Apache BlueCat Linux image. For instance:

3. Partition the IQ80310 flash memory. It is important that the BlueCat Linux image be programmed starting at a certain offset in target flash memory, so as not to overwrite the firmware monitor residing at the beginning of flash memory.

If the firmware monitor is accidentally erased, the IQ80310 board will not boot. In such a case, the Flash Recovery Utility must be used to restore the firmware. Refer to the *IQ80310 Board Manual* for description of the Flash Recovery Utility.

The following flash memory partitioning is safe and recommended.

```
> exec flash_fdisk /dev/mtdchar0 3-63
```

4. Burn the image into target flash memory:

```
> flash /dev/mtdchar1 erase
```

The following screen output is observed:

```
Erasing... done.
getting /tftpboot/apache.kdi
.....
.....
.....
.....
.....
Received 1908736
```

5. This completes the installation of the `apache` demo system into target flash memory. The user can now boot the target.

To do so, connect the IQ80310 GDB port (J9) using a terminal emulation program and reset the target board. This passes control to the BlueCat Linux image in flash memory. The kernel entry point is at offset `0x8000` from the beginning of the image.

For example, if the image is programmed in flash memory at offset 384KB (3 sectors), use the following command:

```
RedBoot> go 0x68000
```

Starting the apache Demo System

After target board boots up, the `bash#` prompt will appear on the J10 console as shown above. Type the following at the `bash#` prompt to start the Apache server.

```
bash# /sbin/ifconfig eth0 target_IP_address
```

```
bash# /usr/sbin/httpd
```

At this point, the Apache web server starts running. One can use a browser such as Internet Explorer or Netscape to open the *target_ip_address* above and see the web pages displayed.

Kernel Configuration Options

The IQ80310 TSP comes with a default BlueCat Linux kernel. This kernel has a number of configuration options. These options are detailed in the tables listed in Table 3-1: Kernel Configuration Options below

Table 3-1: Kernel Configuration Options

Parameters	Table Number
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Table 3-2: System and Processor Type

Option	Value	Description
CONFIG_ARCH_ARC	Y	ARM system type
CONFIG_CPU_ARM7	Y	Optimizes for IQ80310 CPU
CONFIG_BLUECAT_IQ80310_FREQ	100	Internal bus frequency (in MHz)

Table 3-3: Code Maturity Level Options

Option	Value	Description
CONFIG_EXPERIMENTAL	N	Prompts for development and/or incomplete code/drivers
CONFIG_ALIGNMENT_TRAP	N	Enables kernel-mode alignment trap handle (Experimental)
CONFIG_TEXT_SELECTION	N	Splits text into discardable sections

Table 3-4: Loadable Module Support

Option	Value	Description
CONFIG_MODULES	Y	Enables loadable module support
CONFIG_MODVERSIONS	Y	Sets version information on all symbols for modules
CONFIG_KMOD	Y	Kernel module loader

Table 3-5: General Setup

Option	Value	Description
CONFIG_NET	Y	Networking support
CONFIG_PCI	Y	PCI support
CONFIG_PCI_OLD_PROC	Y	Backward-compatible <code>/proc/pci</code>
CONFIG_BLUECAT_THUMB	N	BlueCat Linux kernel support for THUMB binaries
CONFIG_BLUECAT_LOADER	N	BlueCat Linux OS loader
CONFIG_BLUECAT_IGNORE_PRINTK	N	BlueCat Linux ignore <code>printk</code>
CONFIG_BLUECAT_SMALL_FOOTPRINT	N	BlueCat Linux small memory footprint
CONFIG_BLUECAT_IQ80310_LED	N	BlueCat Linux IQ80310 LED control
CONFIG_BLUECAT_MEMSIZE	N	Memory sizing benchmark
CONFIG_SYSVIPC	N	System V IPC
CONFIG_BSD_PROCESS_ACCT	N	BSD Process Accounting
CONFIG_SYSCTL	N	Sysctl support
CONFIG_MATH_EMULATORCONFIG_NWFPE	Y	Math emulator
CONFIG_BINFMT_AOUT	N	Kernel support for <code>a.out</code> binaries
CONFIG_BINFMT_ELF	Y	Kernel support for ELF binaries
CONFIG_BINFMT_MISC	N	Kernel support for MISC binaries
CONFIG_ARTHUR	N	RISC OS personality
CONFIG_PARPORT	N	Parallel port support

Table 3-6: Plug and Play Support

Option	Value	Description
CONFIG_PNP	N	Plug and Play support

Table 3-7: Block Devices

Option	Value	Description
CONFIG_BLK_DEV_FD	N	Normal PC floppy disk support
CONFIG_BLK_DEV_IDE	N	Enhanced IDE/MFM/RLL disk/ CD-ROM/tape/floppy support
CONFIG_BLK_DEV_HD_ONLY	N	Old hard disk (MFM/RLL/IDE) driver
CONFIG_BLK_DEV_LOOP	N	Loopback device support
CONFIG_BLK_DEV_NBD	N	Network block device support
CONFIG_BLK_DEV_MD	N	Multiple devices driver support
CONFIG_BLK_DEV_RAM	Y	RAM disk support
CONFIG_BLK_DEV_INITRD	N	Initial RAM disk (initrd) support
CONFIG_BLUECAT_RFS	Y	BlueCat Linux RFS support
CONFIG_BLK_DEV_GENERIC_FLASH_DOC	N	M-Systems DiskOnChip
CONFIG_BLK_DEV_XD	N	XT hard disk support
CONFIG_BLK_DEV_DAC960	N	Mylex DAC960/DAC1 100 PCI RAID Controller support
CONFIG_PARIDE_PARPORT	N	Parallel port IDE device support
CONFIG_BLK_CPQ_DA	N	Compaq SMART2 support

Table 3-8: Character Devices

Option	Value	Description
CONFIG_VT	N	Virtual terminal
CONFIG_SERIAL	Y	Standard/generic (dumb) serial support
CONFIG_SERIAL_CONSOLE	Y	Support for console on serial port

Table 3-8: Character Devices (Continued)

Option	Value	Description
CONFIG_SERIAL_EXTENDED	N	Extended dumb serial driver options
CONFIG_SERIAL_NONSTANDARD	N	Non-standard serial port support
CONFIG_UNIX98_PTYS	N	UNIX98 PTY support
CONFIG_MOUSE	N	Mouse support (not serial mice)
CONFIG_QIC02_TAPE	N	QIC-02 tape support
CONFIG_WATCHDOG	N	Watchdog Timer support
CONFIG_NVRAM	N	/dev/nvram support
CONFIG_RTC	N	Enhanced Real Time Clock support
CONFIG_DTLK	N	Double Talk PC internal speech card support

Table 3-9: Video for Linux

Option	Value	Description
CONFIG_VIDEO_DEV	N	Video for Linux

Table 3-10: Joystick Support

Option	Value	Description
CONFIG_JOYSTICK	N	Joystick support

Table 3-11: Floppy Tape Device Driver, Ftape

Option	Value	Description
CONFIG_FTAPE	N	Ftape (QIC-80/Travan) support
CONFIG_FT_NORMAL_DEBUG	Not Set	Debugging output
CONFIG_FT_FULL_DEBUG	Not Set	Floppy tape controller

Table 3-12: Networking Options

Option	Value	Description
CONFIG_PACKET	Y	Packet socket
CONFIG_NETLINK	Y	Kernel/User netlink socket
CONFIG_RTNETLINK	Y	Routing messages
CONFIG_NETLINK_DEV	Y	Netlink device emulation
CONFIG_FIREWALL	N	Network firewalls
CONFIG_FILTER	Y	Socket filtering
CONFIG_UNIX	Y	UNIX domain sockets
CONFIG_INET	Y	TCP/IP networking
CONFIG_IP_MULTICAST	Y	IP: Multicasting
CONFIG_IP_ADVANCED_ROUTER	N	IP: Advanced router
CONFIG_IP_PNP	N	IP: Kernel level auto-configuration
CONFIG_IP_ROUTER	N	IP: Optimizes as router, not host
CONFIG_NET_IPIP	N	IP: Tunneling
CONFIG_NET_IPGRE	N	IP: GRE tunnels over IP
CONFIG_IP_MROUTE	N	IP: Multicast routing
CONFIG_IP_ALIAS	N	IP: Aliasing support
CONFIG_SYN_COOKIES	N	IP: TCP <code>syncookie</code> support (Not enabled per default)
CONFIG_INET_RARP	N	IP: Reverse ARP
CONFIG_SKB_LARGE	N	IP: Allows large windows (not recommended if <16MB of memory)
CONFIG_IPX	N	The IPX protocol
CONFIG_ATALK	N	Appletalk DDP

Table 3-13: Amateur Radio Support

Option	Value	Description
CONFIG_HAMRADIO	N	Amateur radio support

Table 3-14: IrDA Subsystem

Option	Value	Description
CONFIG_IRDA	N	IrDA subsystem support

Table 3-15: Network Device Support

Option	Value	Description
CONFIG_NETDEVICES	Y	Network device support
CONFIG_DUMMY	N	Dummy net driver support
CONFIG_EQUALIZER	N	EQL (serial line load balancing) support
CONFIG_NET_SB1000	N	General Instruments Surfboard 1000
CONFIG_FDDI	N	FDDI driver support
CONFIG_PPP	N	PPP (point-to-point) support
CONFIG_SLIP	N	SLIP (serial line) support
CONFIG_NET_RADIO	N	Wireless LAN (non-ham radio)
CONFIG_NET_FC	N	Fibre Channel driver support
CONFIG_SBNI	N	SBNI 12-xx support

Table 3-16: ARCnet Devices

Option	Value	Description
CONFIG_ARCNET	N	ARCnet support

Table 3-17: Ethernet (10 or 100 MBit)

Option	Value	Description
CONFIG_NET_ETHERNET	Y	Ethernet (10 or 100 MBit)
CONFIG_ARM_AM79C961A	N	AM79C961A support
CONFIG_NET_VENDOR_3COM	N	3COM cards

Table 3-17: Ethernet (10 or 100 MBit) (Continued)

Option	Value	Description
CONFIG_LANCE	N	AMD LANCE and PCnet (AT 1500 and NE2100) support
CONFIG_NET_VENDOR_SMC	N	Western Digital/SMC cards
CONFIG_NET_VENDOR_RACAL	N	Racal-Interlan (micom) NI cards
CONFIG_NET_ISA	N	Other ISA cards
CONFIG_NET_EISA	Y	EISA, VLB, PCI and on board controllers
CONFIG_PCNET32	N	AMD PCnet32 (VLB and PCI) support
CONFIG_APRICOT	N	Apricot Xen-II on board Ethernet
CONFIG_CS89x0	N	CS89x0 support
CONFIG_DM9102	N	DM9102 PCI Fast Ethernet Adapter support (Experimental)
CONFIG_DE4X5	N	Generic DECchip & DIGITAL EtherWORKS PCI/EISA
CONFIG_DEC_ELCP	N	DECchip Tulip (dc21x4x) PCI support
CONFIG_DGRS	N	Digi Intl. RightSwitch SE-Xsupport
CONFIG_EEXPRESS_PRO100	Y	EtherExpressPro/100 support
CONFIG_NE2K_PCI	N	PCI NE2000 support
CONFIG_TLAN	N	TI ThunderLAN support
CONFIG_VIA_RHINE	N	VIA Rhine support
CONFIG_NET_POCKET	N	Pocket and portable adaptors

Table 3-18: Token Ring Devices

Option	Value	Description
CONFIG_TR	N	Token Ring driver support

Table 3-19: WAN Interfaces

Option	Value	Description
CONFIG_HOSTESS_SV11	N	Control Hostess SV-11 support
CONFIG_COSA	N	COSA/SRP sync serial boards support
CONFIG_SEALEVEL_4021	N	Sealevel Systems 4021 support
CONFIG_DLCI	N	Frame Relay DLCI support
CONFIG_WAN_DRIVERS	N	WAN drivers

Table 3-20: SCSI Support

Option	Value	Description
CONFIG_SCSI	Y	SCSI support
CONFIG_BLK_DEV_SD	Y	SCSI disk support
CONFIG_BLK_DEV_ST	N	SCSI tape support
CONFIG_BLK_DEV_SR	N	SCSI CD-ROM support
CONFIG_CHR_DEV_SG	N	SCSI generic support
CONFIG_SCSI_MULTI_LUN	N	Probes all LUNs on each SCSI device
CONFIG_SCSI_CONSTANTS	N	Verbose SCSI error reporting (kernel size +=12K)
CONFIG_SCSI_LOGGING	N	SCSI logging facility

Table 3-21: SCSI Low-Level Drivers

Option	Value	Description
CONFIG_SCSI_7000FASST	N	7000FAST SCSI support
CONFIG_SCSI_ACARD	N	ACARD SCSI support
CONFIG_SCSI_AHA152X	N	Adaptec AHA152X/2825 support
CONFIG_SCSI_AHA1542	N	Adaptec AHA1542 support
CONFIG_SCSI_AHA1740	N	Adaptec AHA1740 support

Table 3-21: SCSI Low-Level Drivers (Continued)

Option	Value	Description
CONFIG_SCSI_AIC7XXX	N	Adaptec AIC7xxx support
CONFIG_SCSI_IPS	N	IBM ServeRAID support
CONFIG_SCSI_ADVANSYS	N	AdvanSys SCSI support
CONFIG_SCSI_IN2000	N	Always IN2000 SCSI support
CONFIG_SCSI_AM53C974	N	AM53/79C974 PCI SCSI support
CONFIG_SCSI_MEGARAID	N	AMI MegaRAID support
CONFIG_SCSI_BUSLOGIC	N	BusLogic SCSI support
CONFIG_SCSI_DTC3280	N	DTC3180/3280 SCSI support
CONFIG_SCSI_EATA	N	EATA ISA/EISA/PCI (DPT and generic EATA/DMA-compliant boards) support
CONFIG_SCSI_EATA_DMA	N	EATA-DMA [Obsolete] (DPT, NEC, AT&T, SNI, AST, Olivetti, Alphatronix) support
CONFIG_SCSI_EATA_PIO	N	EATA-PIO (old DPT PM2001, PM2023A) support
CONFIG_SCSI_FUTURE_DOMAIN	N	Future Domain 16xx SCSI/AHA-2920 support
CONFIG_SCSI_GDTH	N	GDT SCSI Disk Array Controller support
CONFIG_SCSI_GENERIC_NCR5380	N	Generic NCR5380/53c400 SCSI support
CONFIG_SCSI_G_NCR5380_PORT	Not Set	NCR5380/53c400 mapping method (use Port for T130B) (PORT)
CONFIG_SCSI_G_NCR5380_MEM	N	NCR5380/53c400 mapping method (use Port for T130B) (MEM)
CONFIG_SCSI_INITIO	N	Initio 9100U(W) support
CONFIG_SCSI_INIA100	N	Initio INI-A100U2W support
CONFIG_SCSI_NCR53C406A	N	NCR53c406a SCSI support
CONFIG_SCSI_SYM53C416	N	Symbios 53c416 SCSI support
CONFIG_SCSI_NCR53C7xx	N	NCR53c78XX SCSI support
CONFIG_SCSI_NCR53C8xx	N	NCR53C8XX SCSI support
CONFIG_SCSI_SYM53C8xx	Y	SYM53C8XX SCSI support

Table 3-21: SCSI Low-Level Drivers (Continued)

Option	Value	DEscription
CONFIG SCSI_NCR53C8xx_DEFAULT_TAGS	8	Default tagged command queue depth
CONFIG SCSI_NCR53C8xx_MAX_TAGS	32	Maximum number of queued commands
CONFIG SCSI_NCR53C8xx_SYNC	20	Synchronous transfers frequency in MHz
CONFIG SCSI_NCR53C8xx_PROFILE	N	Enables profiling
CONFIG SCSI_NCR53C8xx_IOMAPPED	Y	Uses normal IO
CONFIG SCSI_NCR53C8xx_PQS_PDS	N	Includes support for the NCR PQS/PDS SCSI card
CONFIG SCSI_NCR53C8xx_SYMBIOS_COMPAT	N	Assumes boards are SYMBIOS compatible
CONFIG SCSI_PAS16	N	PAS16 SCSI support
CONFIG SCSI_PCI2000	N	PCI2000 support
CONFIG SCSI_PCI2220I	N	PCI2220i support
CONFIG SCSI_PSI240I	N	PSI240i support
CONFIG SCSI_QLOGIC_FAS	N	Qlogic FAS SCSI support
CONFIG SCSI_QLOGIC_ISP	N	Qlogic ISP SCSI support
CONFIG SCSI_QLOGIC_FC	N	Qlogic ISP FC SCSI support
CONFIG SCSI_SEAGATE	N	Seagate ST-02 and Future Domain TMC-8xx SCSI support
CONFIG SCSI_DC390T	N	Tekram DC390(T) and Am53/79C974 SCSI support
CONFIG SCSI_T128	N	Trantor T128/T128F/T228 SCSI support
CONFIG SCSI_U14_34F	N	UltraStor 14F/34F support
CONFIG SCSI_ULTRASTOR	N	UltraStor SCSI support
CONFIG SCSI_DEBUG	N	SCSI debugging cross development host adapter
CONFIG SCSI_INITIO	N	Initio 9100V(W) support
CONFIG SCSI_INIA100	N	Initio INI-A100U2W support

Table 3-22: Sound Support

Option	Value	Description
CONFIG_SOUND	N	Sound support

Table 3-23: Filesystems

Option	Value	Description
CONFIG_QUOTA	N	Quota support
CONFIG_AUTOFS_FS	N	Kernel automounter support
CONFIG_AFFS_FS	N	Amiga FFS filesystem support
CONFIG_HFS_FS	N	Apple Macintosh filesystem support (Experimental)
CONFIG_FAT_FS	N	DOS FAT filesystem support
CONFIG_ISO9660_FS	N	ISO 9660 CD-ROM filesystem support
CONFIG_MINIX_FS	Y	Minix filesystem support
CONFIG_NTFS_FS	N	NTFS filesystem support (read-only)
CONFIG_HPFS_FS	N	OS/2 HPFS filesystem support (read-only)
CONFIG_PROC_FS	Y	/proc filesystem support
CONFIG_ROMFS_FS	N	ROM filesystem support
CONFIG_EXT2_FS	Y	Second extended filesystem support
CONFIG_SYSV_FS	N	System V and Coherent filesystem support
CONFIG_UFS_FS	N	UFS filesystem support
CONFIG_BLUECAT_FFS	N	BlueCat Linux Flash File System support

Table 3-24: Network Filesystems

Option	Value	Description
CONFIG_CODA_FS	N	Coda filesystem support (advanced network filesystem)
CONFIG_NFS_FS	N	NFS filesystem support
CONFIG_SMB_FS	N	SMB filesystem support (to mount WfW shares, etc.)
CONFIG_NCP_FS	N	NCP filesystem support (to mount NetWare volumes)

Table 3-25: Partition Types

Option	Value	Description
CONFIG_BSD_DISKLABEL	N	BSD disklabel (BSD partition tables) support
CONFIG_MAC_PARTITION	N	Macintosh partition map support
CONFIG_SMD_DISKLABEL	N	SMD disklabel (Sun partition tables) support
CONFIG_SOLARIS_X86_PARTITION	N	Solaris (x86) partition table support

Table 3-26: Kernel Hacking

Option	Value	Description
CONFIG_FRAME_POINTER	N	Compile kernel with frame pointer (useful for debugging)
CONFIG_DEBUG_ERRORS	N	Verbose kernel error messages
CONFIG_DEBUG_USER	Y	Verbose user fault messages
CONFIG_DEBUG_INFO	N	Includes debugging information in kernel binary
CONFIG_MAGIC_SYSRQ	N	Magic SysRq key
CONFIG_BLUECAT_KDBG	N	Includes <code>kdbg</code> kernel debugger
CONFIG_BLUECAT_KDBG_TTY0	Not Set	Serial console device

Table 3-27: LynuxWorks Messenger Support

Option	Value	Description
CONFIG_BLUECAT_IOPMAN	N	Enables LynuxWorks IOP Manager support
CONFIG_BLUECAT_MSNG	N	Enables Messenger Support

Table 3-28: Modular Advanced Power Management

Option	Value	Description
CONFIG_BLUECAT_APM	N	Modular Advanced Power Management support

Supported Demo Systems

This chapter provides information about the BlueCat Linux demo systems supported in the IQ80310 Target Support Package (TSP).

Demo Systems

The following table shows the demo systems supported by the IQ80310 Target Support Package (TSP).

Table 4-1: Demo Systems Supported by IQ80310 TSP

Demo System	Default Boot Devices Supported	ROM Requirements	RAM Requirements
apache	Network using the OS loader	1915 KB	7940 KB
developer	Network using the OS loader	2810 KB	10760 KB
gdb	Network using the OS loader	1251 KB	7500 KB
hello	Network using the OS loader	566 KB	3500 KB
kdbg	Network using the OS loader	1251 KB	6500 KB
memsize	Network using the OS loader	1254 KB	7000 KB
osloader	Network using the OS loader	1399 KB	19000 KB
ping	Network using the OS loader	1318 KB	7500 KB
shell	Network using the OS loader	1290 KB	6900 KB

Supported Device Drivers

The following table shows the device drivers supported by the IQ80310 Target Support Package (TSP).

Table 5-1: The Device Drivers Supported by the IQ80310 TSP

Hardware Device	Device Drivers	Location in Source Tree	Kernel Configuration Options	Notes
Flash 8MB flash	iq80310.c	drivers/mtd	CONFIG_MTD_IQ80310	Supported via BlueCat FFS and flash management
Serial Port 2 serial UARTs (16C550)	serial.c	drivers/char	CONFIG_SERIAL	
Ethernet Intel 82559	eeepro100.c	drivers/net	CONFIG_EEXPRESS_PRO100	
LED Display Board specific circuit	iq80310_led.c	arch/arm/special	CONFIG_BLUECAT_IQ80310_LED	

This chapter describes the BlueCat Linux Application Interface specific to the IQ80310 target board.

Advanced MMU/Cache Management Services

The BlueCat Linux kernel for IQ80310 provides a set of advanced MMU/Cache management services for the Intel 80200 processor. These are declared in the

`$BLUECAT_PREFIX/usr/src/linux/include/asm/i80200.h` file.

The following is the list of services available for the kernel components:

```
void i80200_md_attr(unsigned int attr)
```

Sets attributes for Mini Data Cache.

```
attr
```

Defines Mini Data Cache attributes as specified in the Auxiliary Control Register description in the Processor Manual.

`attr` can be one of the following:

- 0 – Write back, Read allocate
- 1 – Write back, Read/Write allocate
- 2 – Write through, Read allocate
- 3 – Unpredictable

```
void i80200_wb_coalescing(int enable)
```

Enables or disables write coalescing.

```
void i80200_dcache_lock(unsigned int addr,  
                        int lines)
```

Locks a number of lines at the specified virtual address into the data cache.

```
void i80200_dcache_unlock(void)
```

Unlocks the data cache.

```
void i80200_icache_lock(unsigned int addr,  
                        int lines)
```

Locks a number of lines at the specified virtual address into the instruction cache.

```
void i80200_icache_unlock(void)
```

Unlocks the instruction cache.

```
void i80200_itlb_lock(unsigned int addr)
```

Translates and locks an ITLB entry.

```
void i80200_dtlb_lock(unsigned int addr)
```

Translates and locks an DTLB entry.

```
void i80200_itlb_unlock(void)
```

Unlocks the ITLB.

```
void i80200_dtlb_unlock(void)
```

Unlocks the DTLB.

LED Display Control

BlueCat Linux for IQ80310 has a device driver for the on-board LED display. The driver is configured using the `CONFIG_BLUECAT_IQ80310_LED` kernel configuration option which can be enabled in the **General Setup** submenu of the `make xconfig` interface. The driver provides an IOCTL interface for the user-space applications, defined in the `BLUECAT_PREFIX/include/asm/iq80310_led_ioctl.h` file.

The driver is accompanied by the

`$BLUECAT_PREFIX/bin/iq80310_led` utility that provides control of the LED display from the shell command line or shell scripts. The utility can be used to control the LED display on the target board. The utility syntax is as follows:

```
iq80310_led value
```

where “*value*” is a numerical value to be displayed on the LED.

For example:

```
# iq80310_led 1.2  
# iq80310_led 55
```

Please note that the utility requires that an LED driver special device file (`/dev/iq80310_led`) is created in the root file system. The major number of this device is 233. For example,

```
mknod /dev/iq80310_led c 233 0
```

