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MontaVista Linux Professional Edition 3.1 Guide for MPC8220(i)

by: Ian Cox
TSPG/MCD/CIO/Systems & Applications Engineering

This application note shows how to perform a typical installation of MontaVista Linux Professional Edition 3.1 (MVL Pro 3.1) on a Linux PC host and build some of the most commonly used Linux targets for Freescale's MPC8220(i) PowerPC platform. The target configurations discussed here include the default network filesystem, initial ramdisk, and hard disk drive filesystems. This document describes requirements, modifications to make, and steps to follow from beginning to end, with tips along the way.

MPC8220(i) is used here to refer to the MPC8220 family of devices, which includes both the standard MPC8220 and imaging MPC8220i.

1 Introduction

Freescale's MPC8220(i) system-on-chip (SoC) is a versatile integrated microprocessor with peripheral combinations that can be used in a variety of consumer electronic products. It embeds an enhanced version of the high-performance PowerPC (PPC) 32-bit 603e core processor with integrated features such as fast Ethernet controller (FEC), universal serial bus (USB), single/double data rate (SDR/DDR), synchronous

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dynamic random access memory (SDRAM), and peripheral component interconnect (PCI) bus. The MPC8220 family builds on the legacy of instruction set architecture (ISA)-compatible devices from the MPC5xxx and MPC822x lines. The MPC8220i includes unique image coprocessor technology that enhances performance on data-intensive graphics applications. This combination of features makes the MPC8220 family well suited to consumer products for imaging and entertainment, network appliances, Internet-access devices, and wireless access control. For reference, two evaluation boards (EVBs) were designed to provide a reference platform and are called Alaska and Yukon. Alaska was the original board design and has since been updated and replaced by Yukon. With the exception of a few differences, both boards are functionally equivalent and will run the MontaVista Linux support package (LSP) with little to no modification.

The MontaVista Linux Professional Edition 3.1 board support package (BSP or LSP) has been released for the MPC8220(i), enabling a company to experience a complete Linux solution for its MPC8220-based platform. Using a MontaVista-certified LSP comes with the assurance that the software is officially supported and maintained by a major name in the Linux development community. MVL Pro is an embedded Linux development kit that contains the Linux kernel source code tree and a complement of development tools to aid design, development, and deployment to the embedded target. Highlights include the Linux 2.4.20 kernel, support for Linux or Windows host environments, configuration plus development tools, and over 290 application packages. It is set up in a cross-compilation environment, which means that the host, typically an IA-32/x86 PC, will compile the source code into binaries or images compatible for the MPC8220(i) PPC target. MontaVista recommends a RedHat 9.0, or equivalent, Linux host for installation. Fedora Core was chosen for demonstration because it is free and compatible with the RedHat 9.0 installation profile. However, many other Linux distributions and Windows are also supported, although not shown.

Linux has gained attention in the marketplace as a low-cost, reliable, and secure operating system (OS) solution with growing support from major corporations. Linux acceptance is expected to continue to grow as it becomes easier to use and more accessible to everyone. The name Linux generally refers to the free UNIX-like open source OS, originally created in 1991 by Linus Torvalds with help from around the globe. The Linux kernel, along with a plethora of components from the GNU Project, makes up what is sometimes called GNU/Linux. GNU, a recursive acronym standing for "GNU is not UNIX", is a project of the Free Software Foundation (FSF), formed in 1983 to create a complete UNIX-like OS from free software. From Wikipedia, the free encyclopedia:

> "The Linux kernel, along with most of the GNU components, is licensed under the GNU General Public License (GPL). The GPL requires that all source code modifications and derived works also be licensed under the GPL, and is sometimes referred to as a "share and share-alike" (or copyleft) license. Other subsystems use other licenses, although all of them share the property of being free/open-source; for example, several libraries use the LGPL (a more-permissive variant of the GPL), and the X Window System uses the permissive (non-copyleft) MIT License."

The final component, Das U-Boot, is a free universal bootloader for Linux which provides firmware for many different architectures. Now managed by project leader Wolfgang Denk of DENX, it has its origins in PPCBoot, the former 8xxROM project by Magnus Damm. Developed under the GPL, it is well suited to embedded systems such as the MPC8220(i). Essentially, U-Boot plays the role of the Basic Input/Output

System (BIOS), performing initializations, controlling boot parameters, and launching the Linux kernel. It also provides a number of other features, such as memory tests, that can be useful for system validation.

1.1   Purpose

This application note shows how to install MontaVista Linux Professional Edition 3.1 on a Linux Fedora Core 3 (FC3) workstation and how to build a Linux target for Freescale's MPC8220(i) PPC platform. While Fedora Core was chosen for its compatibility with RedHat 9.0 and free availability, other Linux distributions can be used if they are listed in the supported hosts or are compatible with one on the list, like Fedora Core. Windows host installation is not covered. This document describes the requirements, modifications to make, and steps to follow from beginning to end, with troubleshooting and alternate steps along the way. Where applicable, extra information, such as configuration files or environmental settings, will be included at the end of each section to help the user.

1.2   Organization

This document is divided into four sections. The first section introduces the concepts and conventions used throughout this application note. The second section identifies the software and hardware tools required, which will be used in the next section. The third section enumerates the steps to successfully complete the task. And last, the fourth section concludes with a brief discussion of the results that should have been achieved upon completion of the tasks.

1.3   Conventions

The following conventions will be used throughout this document to clarify what text means and where it is used.

NOTE
The text formats displayed on the computer will not necessarily match what is shown in this document. These are shown only to make it easier to follow steps.

- All text that is computer input or output is in `courier` font
- A Command Line Interface (CLI) is in **`courier bold`**. Type each command as a single line, even though commands may appear as multiple lines in this document (do not "enter" or "return" until after the entire command has been typed). Text will usually wrap automatically at the end of the line, depending on the terminal. Not all output which follows the commands will be included in this document. Some examples of CLI and how they should be interpreted follow.
  — **`root@Yukon:1>`** means that is the first command the user logged into Yukon (8220 EVB) as `root` is to perform
  — **`user@FC3:7>`** means that this is the seventh command the user logged into FC3 (Fedora Core 3 Linux x86 PC) as a normal `user` is to perform
  — **`user:3>`** means that this is the third command a normal `user` should perform on both systems

- — **root@Yukon:/#** means that the current working directory is / (root) and the user is logged into Yukon as root. This is how the Linux prompt appears on the console.
  - — **=>** is how the U-Boot prompt appears on Yukon
- Filenames, directories, and command line arguments requiring substitution will appear in *italics.*
  - — mkdir *directoryname* means that the user should choose a name for the new directory
  - — ./script *###.###.###.###* means that the user must substitute a network address # for this script
- Text files that require editing are opened here with vi because it is common across many systems, but any program compatible with the UNIX file format could be used, such as Emacs or Gedit. In some cases, this text may be interleaved with text that does not require editing. Line numbers may also be given where necessary. As seen in the example below, the relevant text is in quotes and the edits are <u>underlined</u>.
  - — "ppc_82xx-<u>gcc</u>" means that this line was appended with <u>gcc</u>

A brief note on binary versus decimal units:

- Binary: Mi = mebi = 2^{20} = 1,048,576
- Decimal: M = mega = 10^6 = 1,000,000

Binary units are used when referring to file sizes. Decimal units are used when referring to signaling rates. For example, 1 MiB equals 1,048,576 Bytes, whereas 1 Mbps equals 1,000,000 bits per second. With the exception of direct input/output from programs, this notation will be used throughout the document.

2 Prerequisites

2.1 MPC8220(i) Target

The first requirement is to acquire an Alaska or Yukon EVB, which is usually delivered with a quickstart guide, contact information, preinstalled U-Boot firmware, and sample Linux image ready to run once connected to an ATX power supply (commonly used in PCs). It can also be installed in a typical PC ATX chassis, found at many computer stores. Should any information or software be missing, it can be downloaded from Freescale's Compass site (http://www.freescale.com/compass/) with a valid user account. To request an MPC8220(i) EVB and Compass account from Freescale, please contact your Freescale representative.

- MPC8220(i) Yukon EVB target
- U-Boot 1.1.2
- Linux image (optional)
- Quickstart guide, contact information, notes

2.2 Host PC

The second requirement is a reasonably powerful Linux PC host. For a basic installation with single architecture and LSP, MontaVista specifies a minimum Linux PC host system of 160 MiB of memory and

1.5 GiB of hard disk drive storage space (or another non-volatile storage medium). However, a full installation requires about 6 GiB, of which 1.5 GiB can be reclaimed by deleting the ISOs afterward. Almost any computer manufactured since 2000 should have enough power and a sufficiently large disk for the task: >1 GHz CPU, >256 MiB RAM, >20 GiB HDD. In this case, an x86 Fedora Core (FC3) Linux host or equivalent is suggested, as it is used here for demonstration in place of RedHat 9.0. Also, FC3 is relatively easy and accessible for anyone to obtain and learn, and includes many useful applications for GUI management of system tasks, like network settings, services, and Internet browsers. Fedora Core is a RedHat project, and Linux distributions can be downloaded free of charge from their website (http://fedora.redhat.com/). The process of setting up FC3 on the host will not be discussed in this document, but is fairly easy to do with their live CD/DVD installer. It's assumed that the user has access to or has already installed a Fedora Core or equivalent Linux host before starting.

- IA-32/x86 PC host workstation (>1 GHz CPU, >256 MiB RAM, >20 GiB HDD)
- Fedora Core 3 or equivalent installed

2.3   General Connectivity

The third requirement is general connectivity. For some steps, a network connection is required and generally suggested for both the host and the target. The target must be able to access the host over the network via TCP/IP and can be configured with either static or dynamic IP addresses. Assuming the host is already in the network, at least one extra ethernet cable connection is required for the target to physically join the network. In addition, one null-modem serial cable or adapter will be needed to connect the host to the target directly for console input/output. This enables the user to type in commands and see the results come out. Configuration of network and console settings are discussed in Section 3, "Network File System (Default), Section 4, "Initial RAM Disk, and Section 5, "Hard Disk Drive. Additional requirements may include a hard disk drive and PCI hard disk controller card used for installing on the target. The user is welcome to opt for different types of devices, such as Serial-ATA (SATA) and a corresponding PCI SATA controller card, so long as the PCI card is universal (3.3V-compliant). The following recommendations are provided as examples used in this document:

- Ethernet network connections for both host and target
- Null-modem serial cable or adapter
- Promise Ultra 133-Tx2 (PDC20269) or Ultra 100-Tx2 (PDC20268) PCI hard disk controller
- Maxtor 83201A6 or similar Parallel-ATA-compatible (PATA, ATA, or IDE) hard disk drive

2.4   MontaVista Software

To acquire a license and software for the MPC8220(i), contact a MontaVista representative. For more information on MontaVista, go to http://mvista.com/. When a license is requested, an account allowing access to the MontaVista website should be created, from which the latest files and documentation can be downloaded. Normally, MontaVista will provide a set of CDs with all files necessary to complete the installation. However, if CDs are not provided, the corresponding files are available in the Release Downloads and Updates section on MontaVista Zone (http://support.mvista.com/):

- cross-ppc_82xx-mvl3.1.0.iso (183 MiB)
- development_environment-0401469.iso (536 MiB)

- host-mvl3.1.0.iso (441 MiB)
- host-mvlinstaller-3.1-7.1.0.0401487.i386.mvl (2.2 MiB)
- lsps-ppc_82xx-freescale-8220i-0500649.iso (52 MiB)
- target-ppc_82xx-mvl3.1.0.iso (339 MiB)

This file is not necessary, but may be provided by MontaVista customer support upon request:

- `latest_supported_hosts` file

Save these files to the `mydownloads` directory for later use. If storage space is scarce, they can be deleted after installation is complete.

It's highly recommended that a fresh copy of MontaVista Linux Professional Edition 3.1 be installed on the host system within the default `/opt` directory path. If multiple MVLs are to be installed on the same system, different paths can be used to keep them separate. Do not install over an existing MVL; rather, first uninstall the existing MVL, then install a fresh copy of MVL Pro 3.1.

3 Network File System (Default)

3.1 Installing

For this procedure, the full MVL Pro 3.1 suite will be freshly installed on the Fedora Core 3 Linux PC (preferred). The ISO images of the installation discs must be downloaded to the host prior to installation unless the discs are available. If the MVL installation discs are available, simply insert each disc in the order requested by the installer. The discs should automatically mount on the desktop when they are inserted, so the steps in Section 3.1.1, "Mount the ISO Images can be omitted.

Start a terminal session:

- Click the icon with a > _ in a box

or

- Right-click on the desktop and select terminal

The commands in Section 3.1.1, "Mount the ISO Images are typed into the terminal and then switch over to a browser to complete the installation. FireFox is included in the full install of FC3.

3.1.1 Mount the ISO Images

```
root@FC3:1> mkdir /mnt/loop-crs
root@FC3:2> mkdir /mnt/loop-dev
root@FC3:3> mkdir /mnt/loop-hst
root@FC3:4> mkdir /mnt/loop-lsp
root@FC3:5> mkdir /mnt/loop-tgt
```

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```
root@FC3:6> mount -o ro,loop
mydownloads/cross-ppc_82xx-mvl3.1.0.iso /mnt/loop-crs
root@FC3:7> mount -o ro,loop
mydownloads/development_environment-0401469.iso
/mnt/loop-dev
root@FC3:8> mount -o ro,loop mydownloads/host-mvl3.1.0.iso
/mnt/loop-hst
root@FC3:9> mount -o ro,loop
mydownloads/lsps-ppc_82xx-freescale-8220i-0500649.iso
/mnt/loop-lsp
root@FC3:10> mount -o ro,loop
mydownloads/target-ppc_82xx-mvl3.1.0.iso /mnt/loop-tgt
```

3.1.2   Run the Installer

There are many different ways to run the installer. The default method is shown here without any arguments. In case the installer fails to start or finish, it's recommended the remnants be cleaned up before proceeding with another method. The installer provides a clean-up feature by supplying the proper argument, `--clean`. Several other methods follow in Section 3.1.2.1, "Run the Installer with the Latest Supported Hosts File through Section 3.1.2.3, "Optional Installation Method.

```
root@FC3:11> /mnt/loop-hst/install
Welcome to MontaVista Software's Product Installer.
Starting up, please wait...
MontaVista Software's Product Installer users a web
interface for configuration. See the product documentation
for more information.
The web server is ready, please connect a web browser to:
http://localhost:9999/
or for systems with a text display or less than 800x600
resolution:
http://localhost:9999/mvlinstaller.cgi
(You may use this machine's IP address instead of 127.0.0.1)
```

- If this method doesn't work, clean up:

```
root@FC3:12> /mnt/loop-hst/install --clean

Cleaning temporary files...
Removing temporary files...
```

- Then try the method in Section 3.1.2.1, "Run the Installer with the Latest Supported Hosts File.

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3.1.2.1 Run the Installer with the Latest Supported Hosts File

The list of supported hosts is stored on the host installer CD or ISO image. As new distributions become available, the list will need to be updated to support them. This method takes the `latest_supported_hosts` file which was either modified from the original or provided by MontaVista customer support to include Fedora Core. Note that the current working directory is *mydownloads* but if the file is located elsewhere, the proper path name should be substituted. Again, if the installer fails to work, then clean up, and proceed to the next method.

> **root@FC3:13>** /mnt/loop-hst/install --hostfile
> latest_supported_hosts

- If this method doesn't work, clean up:

    > **root@FC3:14>** /mnt/loop-hst/install --clean

- Then try the method in Section 3.1.2.2, "Modify the System Release File and Run the Installer (Recommended).

3.1.2.2 Modify the System Release File and Run the Installer (Recommended)

This method is most likely to succeed when the others have failed. It works on all current Fedora Core releases and probably works for other distributions, provided they conform to one of the profiles listed in the supported hosts. By including this with the following method, a fast, no-nonsense installation can be performed. Since Fedora Core had identical Fedora release and Redhat release files, it's probably acceptable to leave the changes alone, but if issues arise later, simply copy the Fedora release over the Redhat release files.

> **root@FC3:15>** vi /etc/redhat-release
> "Red Hat Linux release 9 (Shrike)"
> **root@FC3:16>** /mnt/loop-hst/install

3.1.2.3 Optional Installation Method

This method is optional, but convenient for installing on the fly, particularly for installation on multiple machines. Note that the browser interface in the next step still demands human intervention for End User License Agreements (EULAs) and so cannot be done with `--quiet`. If the RedHat release file was modified, no other information is needed, and it's highly unlikely that the installer will fail and need to be cleaned up. But additional parameters, like `--hostfile`, can also be supplied in its place:

> **root@FC3:11>** /mnt/loop-hst/install --automatic --media-host
> /mnt/loop-hst --media-common /mnt/loop-dev --media-lsp
> /mnt/loop-lsp --media-cross /mnt/loop-crs --media-arch
> /mnt/loop-tgt

3.1.3 Connect the Browser

One of the key requirements for installing the full MVL is having a supported Internet browser—yet another reason to go with Fedora Core, which includes FireFox. As MVL installs certain files to FC3, it

---

will prompt the user to switch from the CLI to an Internet browser. When this happens, it will display the loopback address (see below); right-click on the loopback address to open the link in the default Internet browser. Alternately, simply open FireFox and copy, then paste the link from the terminal to the address bar. Continue the installation with the browser, filling in the paths where appropriate, unless using the optional installation method described in Section 3.1.2.3, "Optional Installation Method. Using the default install path, `/opt`, is highly recommended. When installation is finished, click the close window button. This won't actually close the browser, but will feed back to the console that installation is complete and it's time to clean up. Manually close or exit the browser afterward.

```
http://127.0.0.1:9999/
```

3.1.4   Update the MVL Installer

This component enables future updates without uninstalling and reinstalling the entire MVL suite.

```
root@FC3:12> mvl-rpm --nodeps -Uhv
host-mvlinstaller-3.1-7.1.0.0401487.i386.mvl
```

- However, it may need its permissions changed to work— if so, then repeat after:

```
root@FC3> chmod 777
host-mvlinstaller-3.1-7.1.0.0401487.i386.mvl

Preparing...
########################################### [100%]
package host-mvlinstaller-3.1-7.1.0.0401487 is installed
```

3.1.5   Create Personal Workspaces

If multiple users plan to work on the host MVL, personal workspaces should be created to store copies of the MVL components so that each user has a personal copy. If only one user plans to work on the host MVL, then it would be possible to simply use the default root workspace, but one disadvantage is that the user must be logged in as `root` for most operations. Since MVL was installed under `root`, a workspace was created here:

```
/root/montvista/devrocket/workspace
```

- It's recommended to create a personal workspace for each user:

```
root@FC3:13> mkdir myworkspace; cd myworkspace
root@FC3:14> mkdir mykernel
root@FC3:15> mkdir myfilesystem
root@FC3:16> mkdir myramdisk
root@FC3:17> mkdir mybackups
```

3.1.6   Make Backups

Copy or Archive the original unmodified files from the development kit to *myworkspace*. In each step, the method for copying is shown first, followed by archiving, separated by the word or. Archives are

similar to Windows ZIP files in that they store and compress files and directories all into a single archive, also called a tarball. It's a good idea to keep archived backups and `md5sums`, Section 3.1.6.4, "Create MD5 Checksums, to avoid having to retrieve the ISOs or discs. Here, the copy command is shown using the `-a` option for archiving, while the tar command is shown using `-zcvf` to compress and `-zxvf` to decompress the archive using gZip. The latter has the advantage of creating a back-up archive in the process. The important thing is to be consistent.

3.1.6.1   Back Up the Kernel

- To copy:

    root@FC3> cd *mykernel*

    root@FC3> cp -a
    /opt/montavista/pro/devkit/lsp/freescale-8220i-ppc_82xx/linu
    x-2.4.20_mvl31 .

or

- To archive:

    root@FC3> cd
    /opt/montavista/pro/devkit/lsp/freescale-8220i-ppc_82xx

    root@FC3> tar -zcvf
    mybackups/fsl-8220i-linux-2.4.20_mvl31.tgz
    linux-2.4.20_mvl31/

    root@FC3> cd *mykernel*

    root@FC3> tar -zxvf
    mybackups/fsl-8220i-linux-2.4.20_mvl31.tgz

3.1.6.2   Back Up the Filesystem

- To copy:

    root@FC3> cd *myfilesystem*

    root@FC3> cp -a /opt/montavista/pro/devkit/ppc/82xx/target .

or

- To archive:

    root@FC3> cd /opt/montavista/pro/devkit/ppc/82xx/target

    root@FC3> tar -zcvf *mybackups*/fsl-8220i-filesystem_mvl31.tgz
    *

    root@FC3> cd *myfilesystem*

    root@FC3> tar -zxvf *mybackups*/fsl-8220i-filesystem_mvl31.tgz

3.1.6.3   Back Up the Ramdisk

- To copy:

      root@FC3> cd *myramdisk*

      root@FC3> cp -a /opt/montavista/pro/devkit/ppc/82xx/images .

or

- To archive:

      root@FC3> cd /opt/montavista/pro/devkit/ppc/82xx/images

      root@FC3> tar -zcvf *mybackups*/fsl-8220i-ramdisk_mvl31.tgz *

      root@FC3> cd *myramdisk*

      root@FC3> tar -zxvf *mybackups*/fsl-8220i-ramdisk_mvl31.tgz

3.1.6.4   Create MD5 Checksums

The md5sum program calculates the checksum of a file to aid verification. If the naming conventions are followed, the command shown will create a file with the md5sums of all back up files. An example of an md5sum file from MontaVista follows:

      user@FC3> cd *mybackups*

      user@FC3> md5sum fsl-8220i-* > fsl-8220i_mvl31.md5sum

```
The following information is the MD5 checksums of each file

contained in this directory.  This information is used to

verify that the files downloaded from this directory were not

corrupted during the transfer.


      md5sum                            file

-------------------------------   ---------------------------

c2c0e9d7a580529670d13771602dca97  host-mvl3.1.0.iso

5ebed5ae051b93c58d1322e25a0e3f74  target-ppc_82xx-mvl3.1.0.iso

75d352e0a6a678890417d7d4b8add3d8  lsps-ppc_82xx-mvl3.1.0.iso

93c39100932059662544b9c720d22126  cross-ppc_82xx-mvl3.1.0.iso

7ec0fa608c263d54c8b622c8c08cca82  src-mvl3.1.0.iso

1978275d0ec1b1b7893ec4d5a2dd9d06  development_environment-0401469.iso
```

3.1.7 Add MVL to the System Path

The PATH environment variable is necessary for MVL applications to work and tells MVL where to find its binaries. PATH entries are separated by a colon in order of precedence, left to right. For example, to display the current value of PATH:

```
user@FC3> echo $PATH
/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/usr/X11R6/bin:/home/user/bin:/opt/montavista/pro/devkit/ppc/82xx/bin:/opt/montavista/pro/host/bin
```

3.1.7.1 Temporarily Modify Single User's Path

- To append:

```
user@FC3> export PATH=$PATH:/opt/montavista/pro/host/bin
```

or

- To prepend:

```
user@FC3> export PATH=/opt/montavista/pro/host/bin:$PATH
```

3.1.7.2 Permanently Modify Single User's Path

- To append:

```
user@FC3> vi ~/.bash_profile
"PATH=$PATH:/opt/montavista/pro/host/bin"
```

or

- To prepend:

```
user@FC3> vi ~/.bash_profile
"PATH=/opt/montavista/pro/host/bin:$PATH"
```

Ensure that "export PATH" is at the end of the file.

3.1.7.3 Permanently Modify All Users' Paths (Not Recommended)

- To append:

```
root@FC3> vi /etc/profile
"PATH=$PATH:/opt/montavista/pro/host/bin"
```

or

- To prepend:

```
"PATH=/opt/montavista/pro/host/bin:$PATH"
root@FC3> source /etc/profile
```

3.1.8   Modify Cross Compile Path

In order for the kernel to build, it must be able to find the cross compiler. The tools located in the MVL development kit build the Linux source code tree into PPC-compatible binaries and images for the target.

```
user@FC3> cd mykernel/linux-2.4.20_mvl31
user@FC3> vi .hhl_cross_compile
"/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-"
```

3.1.9   Modify Target Installation Directory Path

Assuming a personal workspace was created, the target installation directory path must be modified to reflect it. This path is kept in the Linux top-level `Makefile`:

```
user@FC3> cd mykernel/linux-2.4.20_mvl31
user@FC3> vi Makefile
```

The following patch was generated from a `diff`, a common comparison tool, between the new and old `Makefiles` using the following command. In this example, the new code is indented with < and the old code is indented with >, which comments out the path autoscript and replaces it with the user-specified fixed path. This redirects the module's installation to the user's personal workspace; otherwise, it will install in the default/original path. To simplify this task, look for the underlined sections and modify the `Makefile` to match.

```
user@FC3> diff Makefile Makefile~
103,110c103,108
< #INSTALL_MOD_PATH := $(shell \
< #      if [ -n "`which hhl-whereami 2> /dev/null`" ] ; then \
< #        if [ -f .hhl_target_installdir ]; then \
< #            echo -n "`hhl-whereami`/../../devkit/`cat
.hhl_target_installdir`/target"; \
< #        fi \
< #      fi)
<
< INSTALL_MOD_PATH := myfilesystem
---
> INSTALL_MOD_PATH := $(shell \
>       if [ -n "`which hhl-whereami 2> /dev/null`" ] ; then \
>         if [ -f .hhl_target_installdir ]; then \
>             echo -n "`hhl-whereami`/../../devkit/`cat
>             .hhl_target_installdir`/target"; \
>         fi \
>       fi)
```

If personal workspaces were not used, then the `root` user can use the default root workspace without modification. Alternatively, to temporarily redirect output to a workspace of the user's choice, specify the argument on the command line as follows:

```
root@FC3> make modules_install INSTALL_MOD_PATH=myfilesystem
```

3.2   Building

After MVL is installed, follow these steps to build the default network file system (NFS) Linux `uImage` and copy it to the Trivial File Transfer Protocol (TFTP) directory for booting the target. Fedora Core has a built-in GUI to assist with making this directory, which by default is named `/tftpboot`. Make the permissions on the directory open to any user, `chmod 777 /tftpboot`, or change to `root` user for step 7. Note that changing the user permissions on files or directories may compromise security; proceed with caution. As a reminder, the line `make modules_install` must be performed as `root` and can be replaced with the alternate step described in Section 3.1.9, "Modify Target Installation Directory Path. Since the outputs can be quite long, some have been trimmed for space, but should still give a good illustration of typical output.

```
user@FC3:1> cd mykernel/linux-2.4.20_mvl31
```

- This uses the default configuration for the MPC8220(i), recommended for initial installation.

```
user@FC3:2> make oldconfig
```

```
rm -f include/asm
( cd include ; ln -sf asm-ppc asm)
/bin/sh scripts/Configure -d arch/ppc/config.in
#
# Using defaults found in arch/ppc/defconfig
#

...

*** End of Linux kernel configuration.
*** Check the top-level Makefile for additional configuration.
*** Next, you may run 'make bzImage', 'make bzdisk', or 'make install'.
```

- This deletes any out-of-date dependency files, kernel images, and other files which can cause build errors.

```
user@FC3:3> make clean
```

```
rm -f arch/ppc/kernel/{mk_defs,ppc_defs.h,find_name,checks}
make[1]: Entering directory `arch/ppc/boot'
rm -f mkuboot
make -C images clean
make[2]: Entering directory `arch/ppc/boot/images'
rm -f sImage vmapus vmlinux* miboot* zImage* zvmlinux* uImage
make[2]: Leaving directory `arch/ppc/boot/images'
make -C utils clean
make[2]: Entering directory `arch/ppc/boot/utils'
```

```
rm -f addnote hack-coff mkbugboot mkprep mknote mktree
make[2]: Leaving directory `arch/ppc/boot/utils'
make[1]: Leaving directory `arch/ppc/boot'
find . \( -name '*.[oas]' -o -name core -o -name '.*.flags' \) -type f -print \
| grep -v lxdialog/ | xargs rm -f
rm -f kernel/ksyms.lst include/linux/compile.h vmlinux System.map kernel/ikconfig.h
.tmp* drivers/char/consolemap_deftbl.c drivers/video/promcon_tbl.c
drivers/char/conmakehash drivers/char/drm/*-mod.c drivers/pci/devlist.h
drivers/pci/classlist.h drivers/pci/gen-devlist drivers/zorro/devlist.h
drivers/zorro/gen-devlist drivers/sound/bin2hex drivers/sound/hex2hex
drivers/atm/fore200e_mkfirm drivers/atm/{pca,sba}*{.bin,.bin1,.bin2}
drivers/scsi/aic7xxx/aicasm/aicasm drivers/scsi/aic7xxx/aicasm/aicasm_gram.c
drivers/scsi/aic7xxx/aicasm/aicasm_gram.h
drivers/scsi/aic7xxx/aicasm/aicasm_macro_gram.c
drivers/scsi/aic7xxx/aicasm/aicasm_macro_gram.h
drivers/scsi/aic7xxx/aicasm/aicasm_macro_scan.c
drivers/scsi/aic7xxx/aicasm/aicasm_scan.c drivers/scsi/aic7xxx/aicasm/aicdb.h
drivers/scsi/aic7xxx/aicasm/y.tab.h drivers/scsi/53c700_d.h net/khttpd/make_times_h
net/khttpd/times.h submenu*
rm -rf modules
make -C Documentation/DocBook clean
make[1]: Entering directory `Documentation/DocBook'
rm -f core *~
rm -f wanbook.sgml z8530book.sgml mcabook.sgml videobook.sgml kernel-api.sgml
parportbook.sgml kernel-hacking.sgml kernel-locking.sgml via-audio.sgml
mousedrivers.sgml sis900.sgml deviceiobook.sgml procfs-guide.sgml tulip-user.sgml
journal-api.sgml mip6-func.sgml
rm -f  wanbook.dvi  z8530book.dvi  mcabook.dvi  videobook.dvi  kernel-api.dvi
parportbook.dvi  kernel-hacking.dvi  kernel-locking.dvi  via-audio.dvi
mousedrivers.dvi  sis900.dvi  deviceiobook.dvi  procfs-guide.dvi  tulip-user.dvi
journal-api.dvi  mip6-func.dvi  wanbook.aux  z8530book.aux  mcabook.aux
videobook.aux  kernel-api.aux  parportbook.aux  kernel-hacking.aux
kernel-locking.aux  via-audio.aux  mousedrivers.aux  sis900.aux  deviceiobook.aux
procfs-guide.aux  tulip-user.aux  journal-api.aux  mip6-func.aux  wanbook.tex
z8530book.tex  mcabook.tex  videobook.tex  kernel-api.tex  parportbook.tex
kernel-hacking.tex  kernel-locking.tex  via-audio.tex  mousedrivers.tex  sis900.tex
deviceiobook.tex  procfs-guide.tex  tulip-user.tex  journal-api.tex  mip6-func.tex
wanbook.log  z8530book.log  mcabook.log  videobook.log  kernel-api.log
parportbook.log  kernel-hacking.log  kernel-locking.log  via-audio.log
mousedrivers.log  sis900.log  deviceiobook.log  procfs-guide.log  tulip-user.log
journal-api.log  mip6-func.log  wanbook.out  z8530book.out  mcabook.out
videobook.out  kernel-api.out  parportbook.out  kernel-hacking.out
kernel-locking.out  via-audio.out  mousedrivers.out  sis900.out  deviceiobook.out
procfs-guide.out  tulip-user.out  journal-api.out  mip6-func.out
rm -f  parport-share.png  parport-multi.png  parport-structure.png
parport-share.eps  parport-multi.eps  parport-structure.eps
rm -f procfs_example.sgml
make[1]: Leaving directory `Documentation/DocBook'
```

- This sets up all the dependencies for the build process

        user@FC3:3> make dep

```
make -C arch/ppc/boot fastdep
make[1]: Entering directory `arch/ppc/boot'
scripts/mkdep -D__KERNEL__ -Iinclude -Wall -Wstrict-prototypes -Wno-trigraphs -O2
-fno-strict-aliasing -fno-common -fomit-frame-pointer -Iarch/ppc -fsigned-char
-msoft-float -pipe -ffixed-r2 -Wno-uninitialized -mmultiple -mstring -fno-builtin
-D__BOOTER__ -Iarch/ppc/boot/include  -nostdinc -iwithprefix include --  > .depend
make _sfdep_chrp _sfdep_common _sfdep_lib _sfdep_pmac _sfdep_prep _sfdep_simple
_FASTDEP_ALL_SUB_DIRS="chrp common lib pmac prep simple"
make[2]: Entering directory `arch/ppc/boot'

...

make[1]: Leaving directory `arch/ppc/boot'
```

- This will build the modules if any were configured with loadable module support.

        user@FC3:4> make modules

```
make -C  kernel CFLAGS="-D__KERNEL__ -Iinclude -Wall -Wstrict-prototypes
-Wno-trigraphs -O2 -fno-strict-aliasing -fno-common -fomit-frame-pointer -Iarch/ppc
-fsigned-char -msoft-float -pipe -ffixed-r2 -Wno-uninitialized -mmultiple -mstring
-DMODULE" MAKING_MODULES=1 modules
make[1]: Entering directory `kernel'

...

make[1]: Leaving directory `arch/ppc/8220_io'
```

- This will install the loadable modules into /lib/modules. This is required for the modules to be available to the kernel and should be done as root after building the modules.

        root@FC3:5> make modules_install

```
make -C  kernel modules_install
make[1]: Entering directory `kernel'
make[1]: Nothing to be done for `modules_install'.
make[1]: Leaving directory `kernel'
make -C  drivers modules_install
make[1]: Entering directory `drivers'
make -C block modules_install
make[2]: Entering directory `drivers/block'

...

find kernel -path '*/pcmcia/*' -name '*.o' | xargs -i -r ln -sf ../{} pcmcia
if [ "/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-" = "" ]; then \
            if [ -r System.map ]; then \
                        "/sbin/"depmod -ae -F System.map -b libmodules -r
2.4.20_mvl31-8220i;fi;fi
```

- The final step of the build process compiles the kernel and converts it to a `uImage` which is compatible with U-Boot. This type of image gets its boot parameters from U-Boot.

```
user@FC3:6> make uImage
gcc -Wall -Wstrict-prototypes -O2 -fomit-frame-pointer
-I/opt/montavista/pro/host/bin//../include  -Iarch/ppc -o scripts/split-include
scripts/split-include.c
scripts/split-include include/linux/autoconf.h include/config
/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-gcc -D__KERNEL__ -Iinclude -Wall
-Wstrict-prototypes -Wno-trigraphs -O2 -fno-strict-aliasing -fno-common
-fomit-frame-pointer -Iarch/ppc -fsigned-char -msoft-float -pipe -ffixed-r2
-Wno-uninitialized -mmultiple -mstring   -DKBUILD_BASENAME=main -c -o init/main.o
init/main.c
. scripts/mkversion > .tmpversion
/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-gcc -D__KERNEL__ -Iinclude -Wall
-Wstrict-prototypes -Wno-trigraphs -O2 -fno-strict-aliasing -fno-common
-fomit-frame-pointer -Iarch/ppc -fsigned-char -msoft-float -pipe -ffixed-r2
-Wno-uninitialized -mmultiple -mstring  -DUTS_MACHINE='"ppc"'
-DKBUILD_BASENAME=version -c -o init/version.o init/version.c

...

/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-ld -T arch/ppc/vmlinux.lds -Ttext
0xc0000000 -Bstatic arch/ppc/kernel/head.o arch/ppc/kernel/idle_6xx.o init/main.o
init/version.o init/do_mounts.o \
          --start-group \
          arch/ppc/kernel/kernel.o arch/ppc/platforms/platform.o arch/ppc/mm/mm.o
arch/ppc/lib/lib.o kernel/kernel.o mm/mm.o fs/fs.o ipc/ipc.o \
           drivers/char/char.o drivers/block/block.o drivers/misc/misc.o
drivers/net/net.o drivers/media/media.o drivers/pci/driver.o drivers/mtd/mtdlink.o
drivers/macintosh/macintosh.o arch/ppc/8220_io/8220_io.o \
          net/network.o \
          crypto/crypto.o \
          lib/lib.a \
          --end-group \
          -o vmlinux
/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-nm vmlinux | grep -v
'\(compiled\)\|\(\.o$\)\|\( [aUw] \)\|\(\.\.ng$\)\|\(LASH[RL]DI\)' | sort >
System.map
make[1]: Entering directory `arch/ppc/boot'
make -C images vmlinux.gz
make[2]: Entering directory `arch/ppc/boot/images'
/opt/montavista/pro/devkit/ppc/82xx/bin/ppc_82xx-objcopy --strip-all -S -O binary
vmlinux vmlinux
gzip -vf9 vmlinux
make[2]: Leaving directory `arch/ppc/boot/images'
/bin/sh scripts/mkuboot.sh -A ppc -O linux -T kernel \
-C gzip -a 00000000 -e 00000000 \
-n 'Linux-2.4.20_mvl31-8220i' \
-d images/vmlinux.gz images/vmlinux.UBoot
Image Name:   Linux-2.4.20_mvl31-8220i
Created:      Mon Feb 13 19:27:07 2006
Image Type:   PowerPC Linux Kernel Image (gzip compressed)
```

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```
Data Size:     690756 Bytes = 674.57 kB = 0.66 MB
Load Address: 0x00000000
Entry Point:  0x00000000
ln -sf vmlinux.UBoot images/uImage
make[1]: Leaving directory `arch/ppc/boot'
```

- Copy the uImage to the TFTP boot directory so that it will be accessible to the target.

        user@FC3:7> cp arch/ppc/boot/images/uImage /tftpboot/mvl1.umg

3.3   Booting

3.3.1   Physical Set-up

Connect the target to the Ethernet network over FEC1 and the null-modem serial cable connected from the PSC port on the target to the COM1 serial port on the host. The CPLD dip switch settings on the target are 1 = up, 2 = up, 4 = down, 5 = down. This tells the board to boot from the AMD socket flash where U-Boot resides, select the PSC serial port for communications, and enable the FEC1 and FEC2 interfaces.

3.3.2   Set Up Minicom

Minicom is a terminal emulation program used to communicate with the target from the host. To configure minicom, open minicom on the host at the terminal prompt and use the serial port configuration menu to configure it for 115200 baud, 8 data bits, no parity, 1 stop bit, and the /dev/ttyS0 (COM1 port).

        user@FC3> minicom -s

```
        _____[configuration]_____
        x Filenames and paths      x
        x File transfer protocols  x
        x Serial port setup        x
        x Modem and dialing        x
        x Screen and keyboard      x
        x Save setup as dfl        x
        x Save setup as..          x
        x Exit                     x
        x Exit from Minicom        x

        _____
```

To use `minicom`, after configuring, type `minicom`. If `minicom` says that it cannot access `ttyS0`, then change the permissions and repeat:

```
user@FC3> minicom
Device /dev/ttyS0 access failed: Permission denied.


root@FC3> chmod 777 /dev/ttyS0
```

Note that changing file and directory permissions may compromise security. Though `777` is used here to set full access permissions to anyone and everyone, many users may be more comfortable with more restrictive settings. Proceed with caution and return settings to normal when they're not needed.

3.3.3   Network File System (NFS) Set Up

The preceding steps to build the MVL will create the default NFS image. This means that the target will mount the filesystem over the network from the host. To make this possible, the following steps must be applied to the host. Fedora Core also has a convenient GUI to make the equivalent adjustments instead of using the commands which follow.

```
root@FC3:1> vi /etc/exports
"myfilesystem *(rw,sync,no_root_squash,no_all_squash)"


root@FC3:2> /etc/rc.d/init.d/nfs restart
root@FC3:3> /sbin/chkconfig nfs on
root@FC3:4> /usr/sbin/exportfs -ra
```

If the restart fails, NFS must then be stopped manually and started again. This can sometimes require a reboot of the host system if it fails to respond.

3.3.4   Set Up U-Boot

It is necessary to tell U-Boot what the environmental settings are for it to work properly. To do this, open `minicom` and reset the target. The U-Boot self check sequence will display and then the prompt **=>**. Set the following variables with the host's IP address, a unique target IP address, the gateway address, and the netmask, respectively. Note that the short commands are used here in U-Boot. This means that `set` can be used instead of `setenv` and the addresses are all assumed to be in hex even without the 0x.

```
U-Boot 1.1.2 (Mar 25 2005 - 15:35:10)

CPU:   MPC8220 (JTAG ID 1640301d) at 300 MHz
       CPU 300 MHz, BUS 120 MHz, PCI 30 MHz, FBUS 30 Mhz
       SVCO 480 MHz, CVCO 600 MHz
Board: Alaska MPC8220 Evaluation Board
I2C:   93 kHz, ready
DRAM:  256 MB
FLASH: 16.5 MB
```

Network File System (Default)

```
In:    serial
Out:   serial
Err:   serial
Net:   FEC ETHERNET, FEC1 ETHERNET
```

```
=> set serverip ###.###.###.###
=> set ipaddr ###.###.###.###
=> set gatewayip ###.###.###.###
=> set netmask ###.###.###.###
=> set ethprime FEC1 ETHERNET
=> set ethact FEC1 ETHERNET
```

The `bootargs` must also be set with the relevant addresses and paths. The first IP address is for the host of the remote filesystem, the second is for the target, the third is for the host again, the fourth is for the gateway, and the fifth is for the netmask. This information is passed to the kernel to tell it how to boot Linux properly. Finally, the environmental variables must be saved or they will revert upon reset.

```
=> set bootargs root=/dev/nfs
nfsroot=###.###.###.###:myfilesystem
ip=###.###.###.###:###.###.###.###:###.###.###.###:###.###.#
##.###:Yukon:eth0
=> save


Saving Environment to Flash...


.
Un-Protected 1 sectors
Erasing Flash...
Erasing sector  0 ...  done
Erased 1 sectors
Writing to Flash... done


.
Protected 1 sectors
```

3.3.5   Boot the Target

Now that U-Boot and FC3 have been configured, the target can have the Linux `uImage` loaded and executed. The following U-Boot commands and output are via `minicom`.

```
        => tftp 100000 mvl1.umg
Using FEC ETHERNET device
TFTP from server ###.###.###.###; our IP address is ###.###.###.###
Filename 'mvl1.umg'.
Load address: 0x100000
Loading: *###############################################################
            ################################################################
            ######
done
Bytes transferred = 692840 (a9268 hex)


        => bootm 100000


## Booting image at 00100000 ...
   Image Name:    Linux-2.4.20_mvl31-8220i
   Image Type:    PowerPC Linux Kernel Image (gzip compressed)
   Data Size:     692776 Bytes = 676.5 kB
   Load Address: 00000000
   Entry Point:  00000000
   Verifying Checksum ... OK
   Uncompressing Kernel Image ... OK
Total memory in system: 256 MB
Memory BAT mapping: BAT2=256Mb, BAT3=0Mb, residual: 0Mb
Linux version 2.4.20_mvl31-8220i (gcc version 3.3.1 (MontaVista 3.3.1-3.0.10.0300532
2003-12-24)) #2 Wed May 4 13:08:58 CDT 2005
Motorola Alaska port by Motorola, Inc.
CPLN rev 5
CPLD switches 0x19
Set Pin Mux for FEC1
Set Pin Mux for FEC2
XLB_CONFIG = 00002000
Alaska XLB: Arbiter Master Priority Enable Register = ff
Alaska XLB: Arbiter Master Priority Register = 0
Alaska FPGA PIC: Interrupt Enable Register = 0
Alaska FPGA PIC: Interrupt Status Register = 272080
Setup Alaska PCI Controller:
Hose = 0xc01e3000, hose->cfg_addr=f0000bf8, hose->cfg_data=effff000
Hose IO Base Physical = 0x81000000
Hose IO Base Virtual = 0x81000000
On node 0 totalpages: 65536
zone(0): 65536 pages.
zone(1): 0 pages.
zone(2): 0 pages.
Kernel command line: root=/dev/nfs nfsroot=###.###.###.###:myfilesystem/target
ip=###.###.###.###:###.###.###.###:###.###.###.###:###.###.###.###:Yukon:eth0
Using XLB clock (120.00 MHz) to set up decrementer
Calibrating delay loop... 199.88 BogoMIPS
Memory: 257384k available (1160k kernel code, 440k data, 68k init, 0k highmem)
Dentry cache hash table entries: 32768 (order: 6, 262144 bytes)
Inode cache hash table entries: 16384 (order: 5, 131072 bytes)
Mount-cache hash table entries: 4096 (order: 3, 32768 bytes)
```

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```
Buffer-cache hash table entries: 16384 (order: 4, 65536 bytes)
Page-cache hash table entries: 65536 (order: 6, 262144 bytes)
POSIX conformance testing by UNIFIX
PCI: Probing PCI hardware
Alaska Processor Version Register: 80822013, System Version Register: 80090012
Alaska FPGA Revision: 0x01
Using 64 DMA buffer descriptors
descUsed f0022000, descriptors f0022008 freeSram f0022800
Using 32 DMA buffer descriptors
descUsed f0022800, descriptors f0022804 freeSram f0022900
Linux NET4.0 for Linux 2.4
Based upon Swansea University Computer Society NET3.039
Initializing RT netlink socket
LSP Revision 111
ikconfig 0.5 with /proc/ikconfig
Starting kswapd
Disabling the Out Of Memory Killer
devfs: v1.12c (20020818) Richard Gooch (rgooch@atnf.csiro.au)
devfs: boot_options: 0x1
JFFS2 version 2.2. (C) 2001-2003 Red Hat, Inc.
pty: 256 Unix98 ptys configured
RAMDISK driver initialized: 16 RAM disks of 12288K size 1024 blocksize
physmap flash device: 1000000 at fe000000
phys_mapped_flash: Found 1 x16 devices at 0x0 in 8-bit bank
 Intel/Sharp Extended Query Table at 0x0031
Using buffer write method
cfi_cmdset_0001: Erase suspend on write enabled
kmod: failed to exec /sbin/modprobe -s -k cmdlinepart, errno = 2
cmdlinepart partition parsing not available
kmod: failed to exec /sbin/modprobe -s -k RedBoot, errno = 2
RedBoot partition parsing not available
Using physmap partition definition
Creating 3 MTD partitions on "phys_mapped_flash":
0x00000000-0x00280000 : "kernel"
0x00280000-0x00ee0000 : "user"
0x00fe0000-0x01000000 : "signature"
MPC8220 FEC initialization
NET4: Linux TCP/IP 1.0 for NET4.0
IP Protocols: ICMP, UDP, TCP, IGMP
IP: routing cache hash table of 2048 buckets, 16Kbytes
TCP: Hash tables configured (established 16384 bind 32768)
eth0: PHY detected, address = 0x0000
eth0: FULL DUPLEX
IP-Config: Complete:
      device=eth0, addr=###.###.###.###, mask=###.###.###.###, gw=###.###.###.###,
     host=Yukon, domain=, nis-domain=(none),
     bootserver=###.###.###.###, rootserver=###.###.###.###, rootpath=
NET4: Unix domain sockets 1.0/SMP for Linux NET4.0.
Looking up port of RPC 100003/2 on ###.###.###.###
Looking up port of RPC 100005/1 on ###.###.###.###
VFS: Mounted root (nfs filesystem).
Mounted devfs on /dev
Freeing unused kernel memory: 68k init
```

```
INIT: version 2.78 booting
Activating swap...
Checking all file systems...
fsck 1.27 (8-Mar-2002)
Calculating module dependencies... depmod: *** Unresolved symbols in
/lib/modules/2.4.20_mvl31-8220i/kernel/drivers/input/keybdev.o
done.
Loading modules:
Mounting local filesystems...
nothing was mounted
Cleaning: /etc/network/ifstate.
Setting up IP spoofing protection: rp_filter.
Disable TCP/IP Explicit Congestion Notification: done.
Configuring network interfaces: done.
Starting portmap daemon: portmap.
Cleaning: /tmp /var/lock /var/run.
Starting smbd...
Starting nmbd...
INIT: Entering runlevel: 3
Starting kernel log daemon: klogd.
Starting system log daemon: syslogd.
Starting devfsd: Started device management daemon for /dev
done.
Starting internet superserver: inetd.

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Yukon login: root
Password:
Last login: Thu Jan  1 00:17:38 1970 on console
Linux Yukon 2.4.20_mvl31-8220i #2 Wed May 4 13:08:58 CDT 2005 ppc unknown


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root@Yukon:~# help
GNU bash, version 2.05a.0(1)-release (powerpc-hardhat-linux-gnu)
These shell commands are defined internally.  Type `help' to see this list.
Type `help name' to find out more about the function `name'.
Use `info bash' to find out more about the shell in general.


A star (*) next to a name means that the command is disabled.

 %[DIGITS | WORD] [&]                . filename
 :                                   [ arg... ]
 alias [-p] [name[=value] ... ]      bg [job_spec]
 bind [-lpvsPVS] [-m keymap] [-f fi  break [n]
 builtin [shell-builtin [arg ...]]   case WORD in [PATTERN [| PATTERN].
 cd [-PL] [dir]                      command [-pVv] command [arg ...]
 compgen [-abcdefgjkvu] [-o option]  complete [-abcdefgjkvu] [-pr] [-o
 continue [n]                        declare [-afFrxi] [-p] name[=value
 dirs [-clpv] [+N] [-N]              disown [-h] [-ar] [jobspec ...]
 echo [-neE] [arg ...]               enable [-pnds] [-a] [-f filename]
 eval [arg ...]                      exec [-cl] [-a name] file [redirec
```

Network File System (Default)

```
 exit [n]                                export [-nf] [name ...] or export
 false                                   fc [-e ename] [-nlr] [first] [last
 fg [job_spec]                           for NAME [in WORDS ... ;] do COMMA
 function NAME { COMMANDS ; } or NA       getopts optstring name [arg]
 hash [-r] [-p pathname] [-t] [name      help [-s] [pattern ...]
 history [-c] [-d offset] [n] or hi      if COMMANDS; then COMMANDS; [ elif
 jobs [-lnprs] [jobspec ...] or job      kill [-s sigspec | -n signum | -si
 let arg [arg ...]                       local name[=value] ...
 logout                                  popd [+N | -N] [-n]
 printf format [arguments]               pushd [dir | +N | -N] [-n]
 pwd [-PL]                               read [-ers] [-t timeout] [-p promp
 readonly [-anf] [name ...] or read      return [n]
 select NAME [in WORDS ... ;] do CO      set [--abefhkmnptuvxBCHP] [-o opti
 shift [n]                               shopt [-pqsu] [-o long-option] opt
 source filename                         suspend [-f]
 test [expr]                             time [-p] PIPELINE
 times                                   trap [arg] [signal_spec ...] or tr
 true                                    type [-apt] name [name ...]
 typeset [-afFrxi] [-p] name[=value      ulimit [-SHacdflmnpstuv] [limit]
 umask [-p] [-S] [mode]                  unalias [-a] [name ...]
 unset [-f] [-v] [name ...]              until COMMANDS; do COMMANDS; done
 variables - Some variable names an      wait [n]
 while COMMANDS; do COMMANDS; done       { COMMANDS ; }
root@Yukon:~# reboot
INIT: Switching to runlevel: 6
root@Yukon:~#
Broadcast message from root (console) Thu Jan  1 00:01:07 1970...

The system is going down for reboot NOW !!
INIT: Sending processes the TERM signal
INIT: Sending processes the KILL signal
Stopping portmap daemon: portmap.
Stopping internet superserver: inetd.
Stopping devfsd: done.
Stopping kernel log daemon: klogd.
Stopping system log daemon: syslogd.
Sending all processes the TERM signal... done.
Sending all processes the KILL signal... done.
Unmounting remote filesystems... done.
Deactivating swap... done.
Unmounting local filesystems... umount2: Device or resource busy
umount: none: not found
umount: /dev: Illegal seek
done.
Rebooting... Restarting system.
```

At this point, the Linux kernel boots up and displays a large amount of text. Eventually, it will pause at the login prompt where root should be typed and will then proceed to the shell prompt of Linux. The first thing most users want to do at this point is to change the root password, which is currently unset by default. Simply type passwd at any time to change the password of the current user, root. If the system

doesn't begin to boot, check the network connections on both the host and target. If the system crashes before completely booting, check that the remote filesystem on the host was set up properly.

3.3.5.1 Download and Boot Automatically

Use this method to configure the target to automatically download the Linux image via TFTP from the NFS or another server and to boot the MPC8220(i). The server containing the `uImage` must be network accessible at the time it is downloaded, just as the NFS must be available at the time it is booted. U-Boot is configured to wait 10 seconds before running the commands in the `bootcmd` environmental variable upon reset. Multiple commands can be entered into this variable by separating them with \; . Unless a key is hit, once `bootcmd` has been set, U-Boot will count down `bootdelay` seconds until it autoboots.

```
=> set bootcmd tftp 100000 mvl1.umg\;bootm 100000
=> save
=> reset
```

3.3.5.2 Load and Boot Automatically

Use this method to configure the target to automatically load the Linux image out of Flash and to boot the MPC8220(i). The server hosting the NFS must be available at the time it is booted. U-Boot is configured to wait 10 seconds before running the commands in the `bootcmd` environmental variable upon reset. Multiple commands can be entered into this variable by separating them with \; . Unless a key is hit, once `bootcmd` has been set, U-Boot will count down `bootdelay` seconds until it autoboots.

```
=> tftp 100000 mvl1.umg
=> cp.b 100000 fe000000 a9268
Copy to Flash... \/-\/-\/-\done

=> set bootcmd bootm fe000000
=> save
=> reset
```

3.4 Configuration Files

This section contains examples of the configuration files that were created or modified by the steps outlined in this chapter. These are provided for reference and should match the user's own configuration files closely, if not exactly.

3.4.1 Latest Supported Hosts

```
# This table lists the criteria to identify a host and map it to our
# directory stucture:
#
# <uname -s>:<uname -m>:<shell command>:<expected result>:os_type:mapping
#
Linux:i.*86:cat /etc/mandrake-release:Mandrake Linux release 9\.1
(Bamboo).*:mandrake91
```

Network File System (Default)

```
Linux:i.*86:cat /etc/mandrake-release:Mandrake Linux release 9.2 (FiveStar) for
i586:mandrake91
Linux:i.*86:cat /etc/redhat-release:Red Hat Linux release 7\.3 (Valhalla):redhat73
Linux:i.*86:cat /etc/redhat-release:Red Hat Linux release 8\.0 (Psyche):redhat80
Linux:i.*86:cat /etc/redhat-release:Red Hat Linux release 9 (Shrike):redhat90
Linux:i.*86:cat /etc/redhat-release:Red Hat Enterprise Linux WS release 3
(Taroon):redhat90
Linux:i.*86:cat /etc/redhat-release:Red Hat Enterprise Linux AS release 3 (Taroon
Update 3):redhat90
Linux:i.*86:cat /etc/redhat-release:Fedora Core release 2 (Tettang):redhat90
Linux:i.*86:cat /etc/redhat-release:Fedora Core release 3 (Heidelberg):redhat90
Linux:i.*86:head -n 1 /etc/SuSE-release:SuSE Linux 9\.0.*:suse90
Linux:i.*86:head -n 1 /etc/SuSE-release:SuSE Linux 9\.1.*:suse90
Linux:i.*86:head -n 1 /etc/SuSE-release:SuSE Linux 9\.2.*:suse90
SunOS:sun4u:uname -r:5.7:solaris7
SunOS:sun4u:uname -r:5.8:solaris7
SunOS:sun4u:uname -r:5.9:solaris7
CYGWIN.*:i.*86:true::windows2000
#
# The following will work for any non supported host
# It defaults to using the Red Hat 9.0 release tools as host
#
Linux:i.*86:/bin/true::redhat90
```

3.4.2   Linux .config File

```
#
# Automatically generated by make menuconfig: don't edit
#
# CONFIG_UID16 is not set
# CONFIG_RWSEM_GENERIC_SPINLOCK is not set
CONFIG_RWSEM_XCHGADD_ALGORITHM=y
CONFIG_HAVE_DEC_LOCK=y
CONFIG_GENERIC_ISA_DMA=y

#
# Code maturity level options
#
CONFIG_EXPERIMENTAL=y
CONFIG_ADVANCED_OPTIONS=y

#
# Loadable module support
#
CONFIG_MODULES=y
# CONFIG_MODVERSIONS is not set
CONFIG_KMOD=y

#
# Platform support
#
CONFIG_PPC=y
CONFIG_PPC32=y
```

```
CONFIG_6xx=y
# CONFIG_40x is not set
# CONFIG_44x is not set
# CONFIG_E500 is not set
# CONFIG_POWER3 is not set
# CONFIG_8xx is not set
# CONFIG_8260 is not set
# CONFIG_PQII is not set
CONFIG_PPC_STD_MMU=y
# CONFIG_EMBEDDED_OOM_KILLER is not set
# CONFIG_ALL_PPC is not set
# CONFIG_APUS is not set
# CONFIG_WILLOW is not set
# CONFIG_CPCI690 is not set
# CONFIG_PCORE is not set
# CONFIG_POWERPMC250 is not set
# CONFIG_PPMC260 is not set
# CONFIG_EV64260 is not set
# CONFIG_CHESTNUT is not set
# CONFIG_ARGAN is not set
# CONFIG_SPRUCE is not set
# CONFIG_MENF1 is not set
# CONFIG_PUMA_A is not set
CONFIG_ALASKA=y
# CONFIG_ICECUBE is not set
# CONFIG_HXEB100 is not set
# CONFIG_LOPEC is not set
# CONFIG_MCPN765 is not set
# CONFIG_MVME5100 is not set
# CONFIG_PPLUS is not set
# CONFIG_PRPMC750 is not set
# CONFIG_PRPMC800 is not set
# CONFIG_SANDPOINT is not set
# CONFIG_POWERK2 is not set
# CONFIG_ADIR is not set
# CONFIG_K2 is not set
# CONFIG_PAL4 is not set
# CONFIG_GEMINI is not set
# CONFIG_ZX4500 is not set
CONFIG_MPC8220_PSC_CONSOLE_PORT=0
CONFIG_MPC8220=y
CONFIG_NOT_COHERENT_CACHE=y
# CONFIG_SMP is not set
# CONFIG_PREEMPT is not set
CONFIG_IKCONFIG=y
CONFIG_IKCONFIG_PROC=y
# CONFIG_ALTIVEC is not set
# CONFIG_TAU is not set
CONFIG_PPC_ISATIMER=y
```

Network File System (Default)

```
#
# General setup
#
CONFIG_MAX_POSIX_TIMERS=3000
# CONFIG_HIGH_RES_TIMERS is not set
# CONFIG_HIGHMEM is not set
# CONFIG_KERNEL_START_BOOL is not set
# CONFIG_TASK_SIZE_BOOL is not set
# CONFIG_ILATENCY is not set
# CONFIG_ISA is not set
# CONFIG_EISA is not set
# CONFIG_SBUS is not set
# CONFIG_MCA is not set
CONFIG_PCI=y
CONFIG_NET=y
CONFIG_SYSCTL=y
CONFIG_SYSVIPC=y
CONFIG_SYSVIPC_SEMMNI=128
CONFIG_SYSVIPC_SEMMSL=250
# CONFIG_BSD_PROCESS_ACCT is not set
CONFIG_MAX_USER_RT_PRIO=100
CONFIG_MAX_RT_PRIO=0
CONFIG_KCORE_ELF=y
CONFIG_BINFMT_ELF=y
CONFIG_MULTITHREADED_CORES=y
CONFIG_KERNEL_ELF=y
# CONFIG_BINFMT_MISC is not set
# CONFIG_PCI_NAMES is not set
CONFIG_HOTPLUG=y


#
# PCMCIA/CardBus support
#
# CONFIG_PCMCIA is not set


#
# Parallel port support
#
# CONFIG_PARPORT is not set
# CONFIG_PPC_RTC is not set
# CONFIG_CMDLINE_BOOL is not set


#
# Memory Technology Devices (MTD)
#
CONFIG_MTD=y
# CONFIG_MTD_DEBUG is not set
CONFIG_MTD_PARTITIONS=y
# CONFIG_MTD_CONCAT is not set
# CONFIG_MTD_REDBOOT_PARTS is not set
# CONFIG_MTD_CMDLINE_PARTS is not set
CONFIG_MTD_CHAR=y
```

```
CONFIG_MTD_BLOCK=y
# CONFIG_FTL is not set
# CONFIG_NFTL is not set
# CONFIG_INFTL is not set

#
# RAM/ROM/Flash chip drivers
#
CONFIG_MTD_CFI=y
# CONFIG_MTD_JEDECPROBE is not set
CONFIG_MTD_GEN_PROBE=y
CONFIG_MTD_CFI_ADV_OPTIONS=y
CONFIG_MTD_CFI_NOSWAP=y
# CONFIG_MTD_CFI_BE_BYTE_SWAP is not set
# CONFIG_MTD_CFI_LE_BYTE_SWAP is not set
CONFIG_MTD_CFI_GEOMETRY=y
CONFIG_MTD_MAP_BANK_WIDTH_1=y
# CONFIG_MTD_MAP_BANK_WIDTH_2 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_4 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_8 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_16 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_32 is not set
CONFIG_MTD_CFI_I1=y
# CONFIG_MTD_CFI_I2 is not set
# CONFIG_MTD_CFI_I4 is not set
# CONFIG_MTD_CFI_I8 is not set
CONFIG_MTD_CFI_INTELEXT=y
# CONFIG_MTD_CFI_AMDSTD is not set
# CONFIG_MTD_CFI_STAA is not set
CONFIG_MTD_CFI_UTIL=y
# CONFIG_MTD_RAM is not set
CONFIG_MTD_ROM=y
# CONFIG_MTD_ABSENT is not set
# CONFIG_MTD_OBSOLETE_CHIPS is not set
# CONFIG_MTD_AMDSTD is not set
# CONFIG_MTD_SHARP is not set
# CONFIG_MTD_JEDEC is not set

#
# Mapping drivers for chip access
#
CONFIG_MTD_COMPLEX_MAPPINGS=y
CONFIG_MTD_PHYSMAP=y
CONFIG_MTD_PHYSMAP_START=FE000000
CONFIG_MTD_PHYSMAP_LEN=01000000
CONFIG_MTD_PHYSMAP_BANKWIDTH=2
# CONFIG_MTD_PUMA_A is not set
# CONFIG_MTD_MOT_MVP is not set
# CONFIG_MTD_HXEB100 is not set
# CONFIG_MTD_PPMC260 is not set
# CONFIG_MTD_ARGAN is not set
# CONFIG_MTD_CHESTNUT is not set
```

Network File System (Default)

```
# CONFIG_MTD_CPCI690 is not set
# CONFIG_MTD_PCI is not set
# CONFIG_MTD_PCMCIA is not set

#
# Self-contained MTD device drivers
#
# CONFIG_MTD_PMC551 is not set
# CONFIG_MTD_SLRAM is not set
# CONFIG_MTD_MTDRAM is not set
# CONFIG_MTD_BLKMTD is not set
# CONFIG_MTD_DOC2000 is not set
# CONFIG_MTD_DOC2001 is not set
# CONFIG_MTD_DOC2001PLUS is not set
# CONFIG_MTD_DOCPROBE is not set
# CONFIG_MTD_DOCECC is not set
# CONFIG_MTD_SFLASH is not set

#
# NAND Flash Device Drivers
#
# CONFIG_MTD_NAND is not set
# CONFIG_MTD_NAND_NONGENERIC is not set
# CONFIG_MTD_NAND_DISKONCHIP is not set

#
# Plug and Play configuration
#
# CONFIG_PNP is not set
# CONFIG_ISAPNP is not set

#
# Block devices
#
# CONFIG_BLK_DEV_FD is not set
# CONFIG_BLK_DEV_XD is not set
# CONFIG_PARIDE is not set
# CONFIG_BLK_CPQ_DA is not set
# CONFIG_BLK_CPQ_CISS_DA is not set
# CONFIG_CISS_SCSI_TAPE is not set
# CONFIG_BLK_DEV_DAC960 is not set
# CONFIG_BLK_DEV_UMEM is not set
CONFIG_BLK_DEV_LOOP=m
# CONFIG_BLK_DEV_NBD is not set
CONFIG_BLK_DEV_RAM=y
CONFIG_BLK_DEV_RAM_SIZE=12288
CONFIG_BLK_DEV_INITRD=y
# CONFIG_BLK_STATS is not set
```

```
#
# Multi-device support (RAID and LVM)
#
# CONFIG_MD is not set
# CONFIG_BLK_DEV_MD is not set
# CONFIG_MD_LINEAR is not set
# CONFIG_MD_RAID0 is not set
# CONFIG_MD_RAID1 is not set
# CONFIG_MD_RAID5 is not set
# CONFIG_MD_MULTIPATH is not set
# CONFIG_BLK_DEV_LVM is not set

#
# Cryptography support (CryptoAPI)
#
# CONFIG_CRYPTO is not set
# CONFIG_CIPHERS is not set
# CONFIG_DIGESTS is not set
# CONFIG_CRYPTODEV is not set

#
# Networking options
#
CONFIG_PACKET=y
# CONFIG_PACKET_MMAP is not set
# CONFIG_NETLINK_DEV is not set
CONFIG_NETFILTER=y
# CONFIG_NETFILTER_DEBUG is not set
# CONFIG_FILTER is not set
# CONFIG_NET_NEIGH_DEBUG is not set
# CONFIG_NET_RESTRICTED_REUSE is not set
CONFIG_UNIX=y
CONFIG_INET=y
# CONFIG_REUSEPORT is not set
# CONFIG_IPSEC is not set
CONFIG_IP_MULTICAST=y
# CONFIG_IP_ADVANCED_ROUTER is not set
CONFIG_IP_PNP=y
CONFIG_IP_PNP_DHCP=y
# CONFIG_IP_PNP_BOOTP is not set
# CONFIG_IP_PNP_RARP is not set
# CONFIG_NET_IPIP is not set
# CONFIG_NET_IPGRE is not set
# CONFIG_IP_MROUTE is not set
# CONFIG_ARPD is not set
# CONFIG_INET_ECN is not set
# CONFIG_SYN_COOKIES is not set
CONFIG_IPV4_IPSEC_TUNNEL=y
```

Network File System (Default)

```
#
#   IP: Netfilter Configuration
#
# CONFIG_IP_NF_CONNTRACK is not set
# CONFIG_IP_NF_QUEUE is not set
# CONFIG_IP_NF_IPTABLES is not set
# CONFIG_IP_NF_ARPTABLES is not set
# CONFIG_IP_NF_COMPAT_IPCHAINS is not set
# CONFIG_IP_NF_COMPAT_IPFWADM is not set
CONFIG_IPV6=m
# CONFIG_IPV6_DEBUG is not set
# CONFIG_IPV6_IM is not set
# CONFIG_IPV6_ZONE is not set
# CONFIG_IPV6_DROP_FAKE_V4MAPPED is not set
# CONFIG_IPV6_6TO4_NEXTHOP is not set
# CONFIG_IPV6_PRIVACY is not set
# CONFIG_IPV6_ANYCAST is not set
# CONFIG_IPV6_ISATAP is not set
# CONFIG_IPV6_PREFIXLIST is not set
# CONFIG_IPV6_SUBTREES is not set
# CONFIG_IPV6_ROUTER_PREF is not set
# CONFIG_IPV6_MLD6_ALL_DONE is not set
# CONFIG_IPV6_NODEINFO is not set


#
#   IPv6: Netfilter Configuration
#
# CONFIG_IP6_NF_QUEUE is not set
# CONFIG_IP6_NF_IPTABLES is not set
CONFIG_IPV6_IPSEC_TUNNEL=y
# CONFIG_IPV6_IPV6_TUNNEL is not set
# CONFIG_IPV6_MOBILITY is not set
# CONFIG_KHTTPD is not set
# CONFIG_ATM is not set
# CONFIG_VLAN_8021Q is not set
# CONFIG_IPX is not set
# CONFIG_ATALK is not set


#
# Appletalk devices
#
# CONFIG_DEV_APPLETALK is not set
# CONFIG_DECNET is not set
# CONFIG_BRIDGE is not set
# CONFIG_X25 is not set
# CONFIG_LAPB is not set
# CONFIG_LLC is not set
# CONFIG_NET_DIVERT is not set
# CONFIG_ECONET is not set
# CONFIG_WAN_ROUTER is not set
# CONFIG_NET_FASTROUTE is not set
# CONFIG_NET_HW_FLOWCONTROL is not set
```

```
#
# QoS and/or fair queueing
#
# CONFIG_NET_SCHED is not set


#
# Network testing
#
# CONFIG_NET_PKTGEN is not set


#
# ATA/IDE/MFM/RLL support
#
CONFIG_IDE=m


#
# IDE, ATA and ATAPI Block devices
#
CONFIG_BLK_DEV_IDE=m
# CONFIG_BLK_DEV_HD_IDE is not set
# CONFIG_BLK_DEV_HD is not set
CONFIG_BLK_DEV_IDEDISK=m
# CONFIG_IDEDISK_MULTI_MODE is not set
# CONFIG_IDEDISK_STROKE is not set
# CONFIG_BLK_DEV_IDEDISK_VENDOR is not set
# CONFIG_BLK_DEV_IDEDISK_FUJITSU is not set
# CONFIG_BLK_DEV_IDEDISK_IBM is not set
# CONFIG_BLK_DEV_IDEDISK_MAXTOR is not set
# CONFIG_BLK_DEV_IDEDISK_QUANTUM is not set
# CONFIG_BLK_DEV_IDEDISK_SEAGATE is not set
# CONFIG_BLK_DEV_IDEDISK_WD is not set
# CONFIG_BLK_DEV_COMMERIAL is not set
# CONFIG_BLK_DEV_TIVO is not set
# CONFIG_BLK_DEV_IDECS is not set
CONFIG_BLK_DEV_IDECD=m
# CONFIG_BLK_DEV_IDETAPE is not set
# CONFIG_BLK_DEV_IDEFLOPPY is not set
# CONFIG_BLK_DEV_IDESCSI is not set
# CONFIG_IDE_TASK_IOCTL is not set
# CONFIG_BLK_DEV_CMD640 is not set
# CONFIG_BLK_DEV_CMD640_ENHANCED is not set
# CONFIG_BLK_DEV_ISAPNP is not set
# CONFIG_BLK_DEV_RZ1000 is not set
CONFIG_BLK_DEV_IDEPCI=y
# CONFIG_IDEPCI_SHARE_IRQ is not set
CONFIG_BLK_DEV_IDEDMA_PCI=y
# CONFIG_BLK_DEV_OFFBOARD is not set
# CONFIG_BLK_DEV_IDEDMA_FORCED is not set
CONFIG_IDEDMA_PCI_AUTO=y
# CONFIG_IDEDMA_ONLYDISK is not set
CONFIG_BLK_DEV_IDEDMA=y
# CONFIG_IDEDMA_PCI_WIP is not set
# CONFIG_BLK_DEV_IDEDMA_TIMEOUT is not set
```

Network File System (Default)

```
# CONFIG_IDEDMA_NEW_DRIVE_LISTINGS is not set
CONFIG_BLK_DEV_ADMA=y
# CONFIG_BLK_DEV_AEC62XX is not set
# CONFIG_AEC62XX_TUNING is not set
# CONFIG_BLK_DEV_ALI15X3 is not set
# CONFIG_WDC_ALI15X3 is not set
# CONFIG_BLK_DEV_AMD74XX is not set
# CONFIG_AMD74XX_OVERRIDE is not set
# CONFIG_BLK_DEV_CMD64X is not set
# CONFIG_BLK_DEV_SII_680 is not set
# CONFIG_BLK_DEV_CY82C693 is not set
# CONFIG_BLK_DEV_CS5530 is not set
# CONFIG_BLK_DEV_CS5535 is not set
# CONFIG_BLK_DEV_HPT34X is not set
# CONFIG_HPT34X_AUTODMA is not set
# CONFIG_BLK_DEV_HPT366 is not set
# CONFIG_BLK_DEV_HPT371 is not set
# CONFIG_BLK_DEV_NS87415 is not set
# CONFIG_BLK_DEV_OPTI621 is not set
CONFIG_BLK_DEV_PDC202XX=y
CONFIG_PDC202XX_BURST=y
# CONFIG_PDC202XX_FORCE is not set
# CONFIG_BLK_DEV_SVWKS is not set
# CONFIG_BLK_DEV_SIS5513 is not set
# CONFIG_BLK_DEV_SLC90E66 is not set
# CONFIG_BLK_DEV_TRM290 is not set
# CONFIG_BLK_DEV_VIA82CXXX is not set
# CONFIG_BLK_DEV_SL82C105 is not set
# CONFIG_BLK_DEV_XILLEON is not set
# CONFIG_BLK_DEV_TC86C001 is not set
# CONFIG_IDE_CHIPSETS is not set
CONFIG_IDEDMA_AUTO=y
# CONFIG_IDEDMA_IVB is not set
# CONFIG_DMA_NONPCI is not set
CONFIG_BLK_DEV_IDE_MODES=y
# CONFIG_BLK_DEV_ATARAID is not set
# CONFIG_BLK_DEV_ATARAID_PDC is not set
# CONFIG_BLK_DEV_ATARAID_HPT is not set

#
# SCSI support
#
CONFIG_SCSI=m
CONFIG_BLK_DEV_SD=m
CONFIG_SD_EXTRA_DEVS=40
# CONFIG_CHR_DEV_ST is not set
# CONFIG_CHR_DEV_OSST is not set
# CONFIG_BLK_DEV_SR is not set
CONFIG_CHR_DEV_SG=m
# CONFIG_SCSI_DEBUG_QUEUES is not set
# CONFIG_SCSI_MULTI_LUN is not set
# CONFIG_SCSI_CONSTANTS is not set
# CONFIG_SCSI_LOGGING is not set
```

```
#
# SCSI low-level drivers
#
# CONFIG_BLK_DEV_3W_XXXX_RAID is not set
# CONFIG_SCSI_7000FASST is not set
# CONFIG_SCSI_ACARD is not set
# CONFIG_SCSI_AHA152X is not set
# CONFIG_SCSI_AHA1542 is not set
# CONFIG_SCSI_AHA1740 is not set
# CONFIG_SCSI_AACRAID is not set
# CONFIG_SCSI_AIC7XXX is not set
# CONFIG_SCSI_AIC79XX is not set
# CONFIG_SCSI_AIC7XXX_OLD is not set
# CONFIG_SCSI_DPT_I2O is not set
# CONFIG_SCSI_ADVANSYS is not set
# CONFIG_SCSI_IN2000 is not set
# CONFIG_SCSI_AM53C974 is not set
# CONFIG_SCSI_MEGARAID is not set
# CONFIG_SCSI_BUSLOGIC is not set
# CONFIG_SCSI_CPQFCTS is not set
# CONFIG_SCSI_DMX3191D is not set
# CONFIG_SCSI_DTC3280 is not set
# CONFIG_SCSI_EATA is not set
# CONFIG_SCSI_EATA_DMA is not set
# CONFIG_SCSI_EATA_PIO is not set
# CONFIG_SCSI_FUTURE_DOMAIN is not set
# CONFIG_SCSI_GDTH is not set
# CONFIG_SCSI_GENERIC_NCR5380 is not set
# CONFIG_SCSI_INITIO is not set
# CONFIG_SCSI_INIA100 is not set
# CONFIG_SCSI_NCR53C406A is not set
# CONFIG_SCSI_NCR53C7xx is not set
# CONFIG_SCSI_SYM53C8XX_2 is not set
# CONFIG_SCSI_NCR53C8XX is not set
# CONFIG_SCSI_SYM53C8XX is not set
# CONFIG_SCSI_PAS16 is not set
# CONFIG_SCSI_PCI2000 is not set
# CONFIG_SCSI_PCI2220I is not set
# CONFIG_SCSI_PSI240I is not set
# CONFIG_SCSI_QLOGIC_FAS is not set
# CONFIG_SCSI_QLOGIC_ISP is not set
# CONFIG_SCSI_QLOGIC_FC is not set
# CONFIG_SCSI_QLOGIC_1280 is not set
# CONFIG_SCSI_QLOGIC_23XX is not set
# CONFIG_SCSI_SIM710 is not set
# CONFIG_SCSI_SYM53C416 is not set
# CONFIG_SCSI_DC390T is not set
# CONFIG_SCSI_T128 is not set
# CONFIG_SCSI_U14_34F is not set
# CONFIG_SCSI_DEBUG is not set
```

Network File System (Default)

```
#
# Fusion MPT device support
#
# CONFIG_FUSION is not set
# CONFIG_FUSION_BOOT is not set
# CONFIG_FUSION_ISENSE is not set
# CONFIG_FUSION_CTL is not set
# CONFIG_FUSION_LAN is not set


#
# IEEE 1394 (FireWire) support (EXPERIMENTAL)
#
# CONFIG_IEEE1394 is not set


#
# I2O device support
#
# CONFIG_I2O is not set
# CONFIG_I2O_PCI is not set
# CONFIG_I2O_BLOCK is not set
# CONFIG_I2O_LAN is not set
# CONFIG_I2O_SCSI is not set
# CONFIG_I2O_PROC is not set


#
# Network device support
#
CONFIG_NETDEVICES=y


#
# Broadcom network devices
#
# CONFIG_HND is not set


#
# ARCnet devices
#
# CONFIG_ARCNET is not set
# CONFIG_DUMMY is not set
# CONFIG_BONDING is not set
# CONFIG_EQUALIZER is not set
# CONFIG_IMQ is not set
CONFIG_TUN=m
# CONFIG_ETHERTAP is not set


#
# Ethernet (10 or 100Mbit)
#
CONFIG_NET_ETHERNET=y
# CONFIG_MACE is not set
# CONFIG_BMAC is not set
# CONFIG_GMAC is not set
```

```
# CONFIG_SUNLANCE is not set
# CONFIG_HAPPYMEAL is not set
# CONFIG_SUNBMAC is not set
# CONFIG_SUNQE is not set
# CONFIG_SUNGEM is not set
# CONFIG_NET_VENDOR_3COM is not set
# CONFIG_LANCE is not set
# CONFIG_NET_VENDOR_SMC is not set
# CONFIG_NET_VENDOR_RACAL is not set
# CONFIG_HP100 is not set
# CONFIG_NET_ISA is not set
CONFIG_NET_PCI=y
# CONFIG_PCNET32 is not set
# CONFIG_ADAPTEC_STARFIRE is not set
# CONFIG_APRICOT is not set
CONFIG_TULIP=m
# CONFIG_TULIP_MWI is not set
# CONFIG_TULIP_MMIO is not set
# CONFIG_DE4X5 is not set
# CONFIG_DGRS is not set
# CONFIG_DM9102 is not set
# CONFIG_EEPRO100 is not set
# CONFIG_E100 is not set
# CONFIG_E100_DIAG is not set
# CONFIG_LNE390 is not set
# CONFIG_FEALNX is not set
CONFIG_NATSEMI=m
# CONFIG_NE2K_PCI is not set
# CONFIG_NE3210 is not set
# CONFIG_ES3210 is not set
# CONFIG_8139CP is not set
# CONFIG_8139TOO is not set
# CONFIG_8139TOO_PIO is not set
# CONFIG_8139TOO_TUNE_TWISTER is not set
# CONFIG_8139TOO_8129 is not set
# CONFIG_8139_OLD_RX_RESET is not set
# CONFIG_SIS900 is not set
# CONFIG_EPIC100 is not set
# CONFIG_SUNDANCE is not set
# CONFIG_SUNDANCE_MMIO is not set
# CONFIG_TLAN is not set
# CONFIG_TC35815 is not set
# CONFIG_VIA_RHINE is not set
# CONFIG_VIA_RHINE_MMIO is not set
# CONFIG_WINBOND_840 is not set
# CONFIG_CS89x0 is not set
# CONFIG_NET_POCKET is not set
# CONFIG_MVNET is not set
```

Network File System (Default)

```
#
# Ethernet (1000 Mbit)
#
# CONFIG_ACENIC is not set
# CONFIG_DL2K is not set
# CONFIG_E1000 is not set
# CONFIG_E1000_DIAG is not set
# CONFIG_MYRI_SBUS is not set
# CONFIG_NS83820 is not set
# CONFIG_HAMACHI is not set
# CONFIG_YELLOWFIN is not set
# CONFIG_SK98LIN is not set
# CONFIG_NET_BROADCOM is not set
# CONFIG_TIGON3 is not set
# CONFIG_GIANFAR is not set
# CONFIG_GFAR_NAPI is not set
# CONFIG_GFAR_BDSTASH is not set
# CONFIG_GFAR_BUFSTASH is not set
# CONFIG_FDDI is not set
# CONFIG_HIPPI is not set
# CONFIG_PLIP is not set
CONFIG_PPP=m
# CONFIG_PPP_MULTILINK is not set
# CONFIG_PPP_FILTER is not set
CONFIG_PPP_ASYNC=m
CONFIG_PPP_SYNC_TTY=m
CONFIG_PPP_DEFLATE=m
# CONFIG_PPP_BSDCOMP is not set
# CONFIG_PPPOE is not set
# CONFIG_SLIP is not set

#
# Wireless LAN (non-hamradio)
#
# CONFIG_NET_RADIO is not set

#
# Token Ring devices
#
# CONFIG_TR is not set
# CONFIG_NET_FC is not set
# CONFIG_RCPCI is not set
# CONFIG_SHAPER is not set

#
# Wan interfaces
#
# CONFIG_WAN is not set

#
# Amateur Radio support
#
# CONFIG_HAMRADIO is not set
```

```
#
# IrDA (infrared) support
#
# CONFIG_IRDA is not set

#
# ISDN subsystem
#
# CONFIG_ISDN is not set

#
# Old CD-ROM drivers (not SCSI, not IDE)
#
# CONFIG_CD_NO_IDESCSI is not set

#
# Console drivers
#
# CONFIG_VGA_CONSOLE is not set

#
# Frame-buffer support
#
# CONFIG_FB is not set

#
# Input core support
#
CONFIG_INPUT=m
CONFIG_INPUT_KEYBDEV=m
CONFIG_INPUT_MOUSEDEV=m
CONFIG_INPUT_MOUSEDEV_SCREEN_X=1024
CONFIG_INPUT_MOUSEDEV_SCREEN_Y=768
# CONFIG_INPUT_JOYDEV is not set
CONFIG_INPUT_EVDEV=m

#
# Macintosh device drivers
#

#
# Character devices
#
# CONFIG_VT is not set
# CONFIG_SERIAL is not set
# CONFIG_SERIAL_EXTENDED is not set
# CONFIG_SERIAL_NONSTANDARD is not set

#
# Serial drivers
#
# CONFIG_SERIAL_8250 is not set
# CONFIG_SERIAL_8250_CONSOLE is not set
```

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Network File System (Default)

```
# CONFIG_SERIAL_8250_EXTENDED is not set
# CONFIG_SERIAL_8250_MANY_PORTS is not set
# CONFIG_SERIAL_8250_SHARE_IRQ is not set
# CONFIG_SERIAL_8250_DETECT_IRQ is not set
# CONFIG_SERIAL_8250_MULTIPORT is not set
# CONFIG_SERIAL_8250_HUB6 is not set
CONFIG_UNIX98_PTYS=y
CONFIG_UNIX98_PTY_COUNT=256
# CONFIG_IXP2000_SLAVE is not set


#
# I2C support
#
# CONFIG_I2C is not set


#
# Mice
#
# CONFIG_BUSMOUSE is not set
# CONFIG_MOUSE is not set


#
# Joysticks
#
# CONFIG_INPUT_GAMEPORT is not set
# CONFIG_INPUT_NS558 is not set
# CONFIG_INPUT_LIGHTNING is not set
# CONFIG_INPUT_PCIGAME is not set
# CONFIG_INPUT_CS461X is not set
# CONFIG_INPUT_EMU10K1 is not set
# CONFIG_INPUT_SERIO is not set
# CONFIG_INPUT_SERPORT is not set
# CONFIG_INPUT_ANALOG is not set
# CONFIG_INPUT_A3D is not set
# CONFIG_INPUT_ADI is not set
# CONFIG_INPUT_COBRA is not set
# CONFIG_INPUT_GF2K is not set
# CONFIG_INPUT_GRIP is not set
# CONFIG_INPUT_INTERACT is not set
# CONFIG_INPUT_TMDC is not set
# CONFIG_INPUT_SIDEWINDER is not set
# CONFIG_INPUT_IFORCE_USB is not set
# CONFIG_INPUT_IFORCE_232 is not set
# CONFIG_INPUT_WARRIOR is not set
# CONFIG_INPUT_MAGELLAN is not set
# CONFIG_INPUT_SPACEORB is not set
# CONFIG_INPUT_SPACEBALL is not set
# CONFIG_INPUT_STINGER is not set
# CONFIG_INPUT_DB9 is not set
# CONFIG_INPUT_GAMECON is not set
# CONFIG_INPUT_TURBOGRAFX is not set
# CONFIG_QIC02_TAPE is not set
```

```
#
# Watchdog Cards
#
# CONFIG_WATCHDOG is not set
# CONFIG_LINUX_LED is not set
# CONFIG_CPCI735_LED is not set
# CONFIG_AMD_PM768 is not set
# CONFIG_NVRAM is not set
# CONFIG_RTC is not set
# CONFIG_DTLK is not set
# CONFIG_R3964 is not set
# CONFIG_APPLICOM is not set

#
# Ftape, the floppy tape device driver
#
# CONFIG_FTAPE is not set
# CONFIG_AGP is not set
# CONFIG_DRM is not set
# CONFIG_DEVSOC is not set

#
# Multimedia devices
#
# CONFIG_VIDEO_DEV is not set

#
# File systems
#
# CONFIG_QUOTA is not set
# CONFIG_QFMT_V1 is not set
# CONFIG_QFMT_V2 is not set
# CONFIG_QIFACE_COMPAT is not set
# CONFIG_AUTOFS_FS is not set
CONFIG_AUTOFS4_FS=y
# CONFIG_REISERFS_FS is not set
# CONFIG_REISERFS_CHECK is not set
# CONFIG_REISERFS_PROC_INFO is not set
# CONFIG_ADFS_FS is not set
# CONFIG_ADFS_FS_RW is not set
# CONFIG_AFFS_FS is not set
# CONFIG_HFS_FS is not set
# CONFIG_BEFS_FS is not set
# CONFIG_BEFS_DEBUG is not set
# CONFIG_BFS_FS is not set
CONFIG_EXT3_FS=m
CONFIG_JBD=m
# CONFIG_JBD_DEBUG is not set
CONFIG_FAT_FS=m
CONFIG_MSDOS_FS=m
CONFIG_UMSDOS_FS=m
CONFIG_VFAT_FS=m
# CONFIG_EFS_FS is not set
```

Network File System (Default)

```
# CONFIG_JFFS_FS is not set
CONFIG_JFFS2_FS=y
CONFIG_JFFS2_FS_DEBUG=0
# CONFIG_JFFS2_FS_NAND is not set
# CONFIG_JFFS2_ZLIB is not set
# CONFIG_JFFS2_RTIME is not set
# CONFIG_JFFS2_RUBIN is not set
# CONFIG_JFFS2_LZO is not set
# CONFIG_JFFS2_LZARI is not set
# CONFIG_JFFS2_CMODE_NONE is not set
CONFIG_JFFS2_CMODE_PRIORITY=y
# CONFIG_JFFS2_CMODE_SIZE is not set
# CONFIG_JFFS2_PROC is not set
CONFIG_CRAMFS=y
# CONFIG_POSIX_MQUEUE_FS is not set
CONFIG_TMPFS=y
CONFIG_RAMFS=y
CONFIG_ISO9660_FS=m
CONFIG_JOLIET=y
# CONFIG_ZISOFS is not set
# CONFIG_JFS_FS is not set
# CONFIG_JFS_DEBUG is not set
# CONFIG_JFS_STATISTICS is not set
# CONFIG_MINIX_FS is not set
# CONFIG_VXFS_FS is not set
# CONFIG_NTFS_FS is not set
# CONFIG_NTFS_RW is not set
# CONFIG_HPFS_FS is not set
CONFIG_PROC_FS=y
CONFIG_DEVFS_FS=y
CONFIG_DEVFS_MOUNT=y
# CONFIG_DEVFS_DEBUG is not set
CONFIG_DEVPTS_FS=y
# CONFIG_QNX4FS_FS is not set
# CONFIG_QNX4FS_RW is not set
CONFIG_ROMFS_FS=y
CONFIG_EXT2_FS=y
# CONFIG_SYSV_FS is not set
CONFIG_UDF_FS=m
# CONFIG_UDF_RW is not set
CONFIG_UFS_FS=m
# CONFIG_UFS_FS_WRITE is not set
CONFIG_XFS_FS=m
# CONFIG_XFS_POSIX_ACL is not set
# CONFIG_XFS_RT is not set
# CONFIG_XFS_QUOTA is not set
# CONFIG_XFS_DMAPI is not set
# CONFIG_XFS_DEBUG is not set
# CONFIG_PAGEBUF_DEBUG is not set
```

```
#
# Network File Systems
#
# CONFIG_CODA_FS is not set
# CONFIG_INTERMEZZO_FS is not set
CONFIG_NFS_FS=y
CONFIG_NFS_V3=y
CONFIG_ROOT_NFS=y
CONFIG_NFSD=m
CONFIG_NFSD_V3=y
# CONFIG_NFSD_TCP is not set
CONFIG_SUNRPC=y
CONFIG_LOCKD=y
CONFIG_LOCKD_V4=y
CONFIG_SMB_FS=m
# CONFIG_SMB_NLS_DEFAULT is not set
# CONFIG_NCP_FS is not set
# CONFIG_NCPFS_PACKET_SIGNING is not set
# CONFIG_NCPFS_IOCTL_LOCKING is not set
# CONFIG_NCPFS_STRONG is not set
# CONFIG_NCPFS_NFS_NS is not set
# CONFIG_NCPFS_OS2_NS is not set
# CONFIG_NCPFS_SMALLDOS is not set
# CONFIG_NCPFS_NLS is not set
# CONFIG_NCPFS_EXTRAS is not set
# CONFIG_ZISOFS_FS is not set

#
# Partition Types
#
# CONFIG_PARTITION_ADVANCED is not set
CONFIG_MSDOS_PARTITION=y
CONFIG_SMB_NLS=y
CONFIG_NLS=y

#
# Native Language Support
#
CONFIG_NLS_DEFAULT="iso8859-1"
# CONFIG_NLS_CODEPAGE_437 is not set
# CONFIG_NLS_CODEPAGE_737 is not set
# CONFIG_NLS_CODEPAGE_775 is not set
# CONFIG_NLS_CODEPAGE_850 is not set
# CONFIG_NLS_CODEPAGE_852 is not set
# CONFIG_NLS_CODEPAGE_855 is not set
# CONFIG_NLS_CODEPAGE_857 is not set
# CONFIG_NLS_CODEPAGE_860 is not set
# CONFIG_NLS_CODEPAGE_861 is not set
# CONFIG_NLS_CODEPAGE_862 is not set
# CONFIG_NLS_CODEPAGE_863 is not set
# CONFIG_NLS_CODEPAGE_864 is not set
# CONFIG_NLS_CODEPAGE_865 is not set
# CONFIG_NLS_CODEPAGE_866 is not set
```

Network File System (Default)

```
# CONFIG_NLS_CODEPAGE_869 is not set
# CONFIG_NLS_CODEPAGE_936 is not set
# CONFIG_NLS_CODEPAGE_950 is not set
# CONFIG_NLS_CODEPAGE_932 is not set
# CONFIG_NLS_CODEPAGE_949 is not set
# CONFIG_NLS_CODEPAGE_874 is not set
# CONFIG_NLS_ISO8859_8 is not set
# CONFIG_NLS_CODEPAGE_1250 is not set
# CONFIG_NLS_CODEPAGE_1251 is not set
# CONFIG_NLS_ISO8859_1 is not set
# CONFIG_NLS_ISO8859_2 is not set
# CONFIG_NLS_ISO8859_3 is not set
# CONFIG_NLS_ISO8859_4 is not set
# CONFIG_NLS_ISO8859_5 is not set
# CONFIG_NLS_ISO8859_6 is not set
# CONFIG_NLS_ISO8859_7 is not set
# CONFIG_NLS_ISO8859_9 is not set
# CONFIG_NLS_ISO8859_13 is not set
# CONFIG_NLS_ISO8859_14 is not set
# CONFIG_NLS_ISO8859_15 is not set
# CONFIG_NLS_KOI8_R is not set
# CONFIG_NLS_KOI8_U is not set
# CONFIG_NLS_UTF8 is not set

#
# Sound
#
# CONFIG_SOUND is not set

#
# MPC8220 I/O Options
#
CONFIG_PPC_8220_PSC=y
CONFIG_PPC_8220_PSC_CONSOLE=y
CONFIG_SERIAL_CONSOLE=y
CONFIG_BESTDMA=y
CONFIG_ALASKA_FEC=y
CONFIG_ALASKA_1284=m
CONFIG_ALASKA_1284_DMA=y

#
# USB support
#
CONFIG_USB=m
# CONFIG_USB_DEBUG is not set
CONFIG_USB_DEVICEFS=y
# CONFIG_USB_BANDWIDTH is not set
CONFIG_USB_LONG_TIMEOUT=y
# CONFIG_USB_EHCI_HCD is not set
# CONFIG_USB_MX2_OTG is not set
# CONFIG_USB_MX2_HCD is not set
# CONFIG_USB_UHCI is not set
# CONFIG_USB_UHCI_ALT is not set
```

```
CONFIG_USB_OHCI=m
# CONFIG_USB_NON_PCI_OHCI is not set
CONFIG_USB_OHCI_MPC8220I=m
# CONFIG_USB_AUDIO is not set
# CONFIG_USB_EMI26 is not set
# CONFIG_USB_BLUETOOTH is not set
# CONFIG_USB_MIDI is not set
CONFIG_USB_STORAGE=m
CONFIG_USB_STORAGE_DEBUG=y
CONFIG_USB_STORAGE_DATAFAB=y
# CONFIG_USB_STORAGE_FREECOM is not set
CONFIG_USB_STORAGE_ISD200=y
CONFIG_USB_STORAGE_DPCM=y
# CONFIG_USB_STORAGE_HP8200e is not set
CONFIG_USB_STORAGE_SDDR09=y
CONFIG_USB_STORAGE_SDDR55=y
CONFIG_USB_STORAGE_JUMPSHOT=y
# CONFIG_USB_ACM is not set
CONFIG_USB_PRINTER=m
CONFIG_USB_HID=m
CONFIG_USB_HIDINPUT=y
# CONFIG_USB_HIDDEV is not set
# CONFIG_USB_KBD is not set
# CONFIG_USB_MOUSE is not set
# CONFIG_USB_AIPTEK is not set
# CONFIG_USB_WACOM is not set
# CONFIG_USB_DC2XX is not set
# CONFIG_USB_MDC800 is not set
# CONFIG_USB_SCANNER is not set
# CONFIG_USB_MICROTEK is not set
# CONFIG_USB_HPUSBSCSI is not set
# CONFIG_USB_PEGASUS is not set
# CONFIG_USB_RTL8150 is not set
# CONFIG_USB_KAWETH is not set
# CONFIG_USB_CATC is not set
# CONFIG_USB_CDCETHER is not set
# CONFIG_USB_USBNET is not set
# CONFIG_USB_USS720 is not set


#
# USB Serial Converter support
#
# CONFIG_USB_SERIAL is not set
# CONFIG_USB_RIO500 is not set
# CONFIG_USB_AUERSWALD is not set
# CONFIG_USB_TIGL is not set
# CONFIG_USB_BRLVGER is not set
# CONFIG_USB_LCD is not set
```

Network File System (Default)

```
#
# USB Device Support
#
CONFIG_USBD=m
CONFIG_USBD_VENDORID=0000
CONFIG_USBD_PRODUCTID=0000
CONFIG_USBD_PRODUCT_NAME="Yukon"
CONFIG_USBD_MANUFACTURER="Freescale"
# CONFIG_USBD_USE_SERIAL_NUMBER is not set
# CONFIG_USBD_SELFPOWERED is not set
CONFIG_USBD_MAXPOWER=0
# CONFIG_USBD_EP0_SUPPORT is not set
# CONFIG_USBD_MONITOR is not set
# CONFIG_USBD_PROCFS is not set
CONFIG_ALASKA_USB=m
CONFIG_ALASKA_USB_DMA=y
# CONFIG_USBD_M8xx_TTY is not set
# CONFIG_USBD_PQ2_TTY is not set

#
# Network Function
#
# CONFIG_USBD_NET is not set

#
# Serial Function
#
# CONFIG_USBD_SERIAL is not set

#
# Mouse Function
#
# CONFIG_USBD_MOUSE is not set

#
# Mass Storage Function
#
# CONFIG_USBD_STORAGE is not set

#
# EP0 test Function
#
# CONFIG_USBD_TEST is not set

#
# USB Device Bus Interface Support
#
# CONFIG_USBD_GENERIC_BUS is not set
```

```
#
# Bluetooth support
#
# CONFIG_BLUEZ is not set

#
# Kernel tracing
#
# CONFIG_TRACE is not set
# CONFIG_TRACE_BOOT is not set

#
# Library routines
#
CONFIG_ZLIB_INFLATE=y
CONFIG_ZLIB_DEFLATE=m

#
# Kernel hacking
#
# CONFIG_DEBUG_KERNEL is not set
# CONFIG_SERIAL_TEXT_DEBUG is not set
```

4   Initial RAM Disk

4.1   Overview

The purpose of this section is to configure the Linux kernel to boot using an INITial Ram Disk (INITRD) filesystem instead of the default NFS. This will create a lite filesystem that can fit in the small footprint of a non-volatile memory device such as the MPC8220(i) onboard 16 MiB Intel StrataFlash. This can be useful in situations where the stand-alone 8220 may not be connected to a network nor a hard disk drive for its filesystem. It can also provide a single-shot solution for board bring up, where only an initial boot up out of memory is necessary. One of the shortcomings with INITRD is that it doesn't include some of the features that come with full-fledged filesystems such as NFS and HDD, discussed separately. One important omission is the set of development tools, so local compilation on the target will not be possible. Topics covered previously, such as building the kernel and setting up `minicom`, will not be repeated.

4.2   Procedure

Since this is the first mention of `menuconfig`, the menu-driven configurator for Linux, a brief explanation is in order. The `menuconfig` user interface is convenient because it streamlines the old text-based configuration interface with blue menus that organize components into groups while maintaining functionality and accessibility. The interface is made easier by navigating with the arrow keys and `y`, `m`, `n`, and `?` keys. They are similar in that both `menuconfig` and `config` can be run over `telnet` sessions without a GUI. If preferred, run `config` instead of `menuconfig`, by replacing `menuconfig` at line 2 with `config` and carefully answering all the configuration questions to match this step.

4.2.1   Configure the Kernel

user@FC3:1> cd *mykernel*

user@FC3:2> make menuconfig

Linux Kernel v2.4.20_mvl31-8220i Configuration

_____

                              Main Menu
 x Arrow keys navigate the menu. <Enter> selects submenus --->. x
 x Highlighted letters are hotkeys. Pressing <Y> includes,   x
 x <N> excludes, <M> modularizes features. Press <Esc><Esc> to x
 x exit, <?> for Help.   x
 x Legend: [*] built-in [ ] excluded <M> module < > module capable
_____

    x x   Code maturity level options --->   x x
    x x   Loadable module support --->   x x
     x x   Platform support   --->   x x
    x x   General setup --->   x x
    x x   Memory Technology Devices (MTD) --->   x x
    x x   Plug and Play configuration --->   x x
    x x   Block devices --->   x x
    x x   Multi-device support (RAID and LVM) --->   x x
    x x   Cryptography support (CryptoAPI) --->   x x
    x x   Networking options --->   x x
    x x   ATA/IDE/MFM/RLL support --->   x x
    x x   SCSI support --->   x x
    x x   Fusion MPT device support --->   x x
    x x   IEEE 1394 (FireWire) support (EXPERIMENTAL) --->   x x
    x x   I2O device support --->   x x
    x x   Network device support --->   x x
    x x   Amateur Radio support --->   x x
    x x   IrDA (infrared) support --->   x x

```
x x        ISDN subsystem  --->                        x x
x x      Old CD-ROM drivers (not SCSI, not IDE)  --->   x x
x x       Console drivers  --->                        x x
x x       Input core support  --->                     x x
x x      Macintosh device drivers  --->                x x
x x       Character devices  --->                      x x
x x       Multimedia devices  --->                     x x
x x       File systems  --->                           x x
x x        Sound  --->                                 x x
x x      MPC8220 I/O Options  --->                     x x
x x       USB support  --->                            x x
x x       USB Device Support  --->                     x x
x x       Bluetooth support  --->                      x x
x x       Kernel tracing  --->                         x x
x x       Library routines  --->                       x x
x x       Kernel hacking  --->                         x x
x x        ---                                         x x
x x      Load an Alternate Configuration File          x x
x x       Save Configuration to an Alternate File      x x
x x                                                    x x
x x                                                    x x
_____

x              <Select>   < Exit >   < Help >              x
```

- In `menuconfig`, set the following parameters:

  ```
  File Systems: <disable root filesystem on NFS>
  Block Devices: <enable RAM disk support>
    <enable Initial RAM disk support>
    <(8192) Default RAM disk size>
  General Setup: <disable Default bootloader kernel arguments>
  Networking Options: <disable IP: Kernel level autoconfiguration>
  ```

Specifically, the default RAM disk size can be customized, depending on how much memory is available. Disabling the default bootloader kernel arguments can expedite the boot sequence by skipping the DHCP. But disabling `IP: Kernel-level autoconfiguration` will also disable `IP: DHCP support`.

- When complete, exit and save the changes:

  ```
  < Exit >
  Do you wish to save your new kernel configuration?
  < Yes >
  Your kernel configuration changes were saved.
  ```

4.2.2   Build the Kernel

Since the initial procedures prepared MVL for building, only the dependencies must be updated before rebuilding the kernel image. But if the initial procedures were skipped, review Section 3.2, "Building. Because modules increase the size of the filesystem, they generally aren't used for the INITRD.

```
user@FC3:5> make clean
user@FC3:6> make dep
user@FC3:7> make uImage
user@FC3:8> cp arch/ppc/boot/images/uImage /tftpboot/mvl3.umg
```

4.2.3   Make Initial Ramdisk

```
user@FC3:9> cd myramdisk
user@FC3:10> mkimage -A ppc -O linux -T ramdisk -C gzip -a 0
-e 0 -n uboot_ramdisk -d ramdisk.gz initrd

Image Name:    uboot_ramdisk
Created:       Fri Feb 10 17:21:08 2006
Image Type:    PowerPC Linux RAMDisk Image (gzip compressed)
Data Size:     1827099 Bytes = 1784.28 kB = 1.74 MB
Load Address: 0x00000000
Entry Point:  0x00000000

user@FC3:11> cp initrd /tftpboot/.
```

4.2.4   Set U-Boot Bootargs and Boot

```
=> set bootargs root=/dev/ram rw
=> save
=> tftp 100000 mvl3.umg
```

```
Using FEC ETHERNET device
TFTP from server ###.###.###.###; our IP address is ###.###.###.###
Filename 'mvl3.umg'.
Load address: 0x100000
Loading: *##################################################################
        ##################################################################
        ####
done
Bytes transferred = 685877 (a7735 hex)


        => tftp 200000 initrd


Using FEC ETHERNET device
TFTP from server ###.###.###.###; our IP address is ###.###.###.###
Filename 'initrd'.
Load address: 0x200000
Loading: *##################################################################
        ##################################################################
        ##################################################################
        ##################################################################
        ##################################################################
        ##############################
done
Bytes transferred = 1827163 (1be15b hex)


        => bootm 100000 200000


## Booting image at 00100000 ...
   Image Name:   Linux-2.4.20_mvl31-8220i
   Image Type:   PowerPC Linux Kernel Image (gzip compressed)
   Data Size:    685813 Bytes = 669.7 kB
   Load Address: 00000000
   Entry Point:  00000000
   Verifying Checksum ... OK
   Uncompressing Kernel Image ... OK
## Loading RAMDisk Image at 00200000 ...
   Image Name:   uboot_ramdisk
   Image Type:   PowerPC Linux RAMDisk Image (gzip compressed)
   Data Size:    1827099 Bytes =  1.7 MB
   Load Address: 00000000
   Entry Point:  00000000
   Verifying Checksum ... OK
   Loading Ramdisk to 0fd92000, end 0ff5011b ... OK
Total memory in system: 256 MB
Memory BAT mapping: BAT2=256Mb, BAT3=0Mb, residual: 0Mb
Linux version 2.4.20_mvl31-8220i (gcc version 3.3.1 (MontaVista 3.3.1-3.0.10.0300532
2003-12-24)) #5 Tue May 10 16:25:13 CDT 2005
Motorola Alaska port by Motorola, Inc.
CPLN rev 5
CPLD switches 0x19
```

```
Set Pin Mux for FEC1
Set Pin Mux for FEC2
XLB_CONFIG = 00002000
Alaska XLB: Arbiter Master Priority Enable Register = ff
Alaska XLB: Arbiter Master Priority Register = 0
Alaska FPGA PIC: Interrupt Enable Register = 0
Alaska FPGA PIC: Interrupt Status Register = 272080
Setup Alaska PCI Controller:
Hose = 0xc01de000, hose->cfg_addr=f0000bf8, hose->cfg_data=effff000
Hose IO Base Physical = 0x81000000
Hose IO Base Virtual = 0x81000000
On node 0 totalpages: 65536
zone(0): 65536 pages.
zone(1): 0 pages.
zone(2): 0 pages.
Kernel command line: root=/dev/ram rw
Using XLB clock (120.00 MHz) to set up decrementer
Calibrating delay loop... 199.88 BogoMIPS
Memory: 255616k available (1160k kernel code, 432k data, 56k init, 0k highmem)
Dentry cache hash table entries: 32768 (order: 6, 262144 bytes)
Inode cache hash table entries: 16384 (order: 5, 131072 bytes)
Mount-cache hash table entries: 4096 (order: 3, 32768 bytes)
Buffer-cache hash table entries: 16384 (order: 4, 65536 bytes)
Page-cache hash table entries: 65536 (order: 6, 262144 bytes)
POSIX conformance testing by UNIFIX
PCI: Probing PCI hardware
Alaska Processor Version Register: 80822013, System Version Register: 80090012
Alaska FPGA Revision: 0x01
Using 64 DMA buffer descriptors
descUsed f0022000, descriptors f0022008 freeSram f0022800
Using 32 DMA buffer descriptors
descUsed f0022800, descriptors f0022804 freeSram f0022900
Linux NET4.0 for Linux 2.4
Based upon Swansea University Computer Society NET3.039
Initializing RT netlink socket
LSP Revision 111
ikconfig 0.5 with /proc/ikconfig
Starting kswapd
Disabling the Out Of Memory Killer
devfs: v1.12c (20020818) Richard Gooch (rgooch@atnf.csiro.au)
devfs: boot_options: 0x1
JFFS2 version 2.2. (C) 2001-2003 Red Hat, Inc.
pty: 256 Unix98 ptys configured
RAMDISK driver initialized: 16 RAM disks of 12288K size 1024 blocksize
physmap flash device: 1000000 at fe000000
phys_mapped_flash: Found 1 x16 devices at 0x0 in 8-bit bank
 Intel/Sharp Extended Query Table at 0x0031
Using buffer write method
cfi_cmdset_0001: Erase suspend on write enabled
kmod: failed to exec /sbin/modprobe -s -k cmdlinepart, errno = 2
cmdlinepart partition parsing not available
kmod: failed to exec /sbin/modprobe -s -k RedBoot, errno = 2
RedBoot partition parsing not available
```

```
Using physmap partition definition
Creating 3 MTD partitions on "phys_mapped_flash":
0x00000000-0x00280000 : "kernel"
0x00280000-0x00ee0000 : "user"
0x00fe0000-0x01000000 : "signature"
MPC8220 FEC initialization
NET4: Linux TCP/IP 1.0 for NET4.0
IP Protocols: ICMP, UDP, TCP, IGMP
IP: routing cache hash table of 2048 buckets, 16Kbytes
TCP: Hash tables configured (established 16384 bind 32768)
NET4: Unix domain sockets 1.0/SMP for Linux NET4.0.
RAMDISK: Compressed image found at block 0
Freeing initrd memory: 1784k freed
VFS: Mounted root (ext2 filesystem).
Mounted devfs on /dev
Freeing unused kernel memory: 56k init
INIT: version 2.78 booting
Activating swap...
Mounting local filesystems...
nothing was mounted
Setting up IP spoofing protection\: rp_filter.
Disable TCP/IP Explicit Congestion Notification\: done.
Configuring network interfaces\: eth0: PHY detected, address = 0x0000
eth0: FULL DUPLEX
dhcpcd[93]: infinite IP address lease time. Exiting

done.
Starting portmap daemon\: portmap.
INIT: Entering runlevel: 3
Starting internet superserver\: inetd.

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 (none) login: root
login[143]: cannot open securetty file.



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login[143]: root login  on `console'



BusyBox v0.60.3 (2004.01.09-22:53+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

# reboot       help
```

```
Built-in commands:
------------------
            . : alias break builtin cd chdir continue eval exec exit exp
            export false fc hash help jobs let local read readonly return
            set setvar shift times trap true type ulimit umask unalias unset
            wait

# reboot
INIT: Switching to runlevel: 6
INIT: Sending processes the TERM signal
Terminated
# INIT: Sending processes the KILL signal
Stopping portmap daemon\: portmap.
Stopping internet superserver\: inetd.
Sending all processes the TERM signal... done.
Sending all processes the KILL signal... done.
Rebooting... Restarting system.
```

At this point, the Linux kernel will boot up and display a large amount of text. Eventually, it will pause at the login prompt, where `root` should be typed, and it will then proceed to the shell prompt of Linux. The first thing most users want to do at this point is set or change the `root` password if it hasn't already been set. Simply type the command `passwd` and follow the prompts to change the `root` user's password. If the system fails to boot up properly, check that the commands were typed in properly and that U-Boot has the correct `bootargs`. Also, try loading the images into different locations.

4.2.4.1   Download and Boot Automatically

Use this method to configure the target to automatically download the Linux and INITRD image via TFTP from the server and to boot the MPC8220(i). The server containing the `uImage` and INITRD must be network accessible at the time it is downloaded. Upon reset, U-Boot is configured to wait 10 seconds before running the commands in the `bootcmd` environmental variable. Multiple commands can be entered into this variable by separating them with \; .

> **=>** `set bootcmd tftp 100000 ` *`mvl3.umg`*`\;tftp 200000 initrd\;bootm 100000 200000`
>
> **=>** `save`
>
> **=>** `reset`

4.2.4.2   Load and Boot Automatically

Use this method to configure the target to automatically load the Linux and INITRD image out of Flash and to boot the MPC8220(i). In this case, no server is required after the files have initially been TFTP'd. Upon reset, U-Boot is configured to wait 10 seconds before running the commands in the `bootcmd` environmental variable. Multiple commands can be entered into this variable by separating them with \; .

> **=>** `tftp 100000 ` *`mvl3.umg`*
>
> **=>** `cp.b 100000 fe000000 a7735`
>
> `Copy to Flash... \/-\/-\/-\done`

```
=> tftp 200000 initrd
=> cp.b 200000 fe100000 1be15b
Copy to Flash... /-\/-\/-\/-\/-\/-\/-\/-\done

=> set bootcmd bootm fe000000 fe100000
=> save
=> reset
```

4.3   Configuration Files

```
#
# Automatically generated by make menuconfig: don't edit
#
# CONFIG_UID16 is not set
# CONFIG_RWSEM_GENERIC_SPINLOCK is not set
CONFIG_RWSEM_XCHGADD_ALGORITHM=y
CONFIG_HAVE_DEC_LOCK=y
CONFIG_GENERIC_ISA_DMA=y

#
# Code maturity level options
#
CONFIG_EXPERIMENTAL=y
CONFIG_ADVANCED_OPTIONS=y

#
# Loadable module support
#
CONFIG_MODULES=y
# CONFIG_MODVERSIONS is not set
CONFIG_KMOD=y

#
# Platform support
#
CONFIG_PPC=y
CONFIG_PPC32=y
CONFIG_6xx=y
# CONFIG_40x is not set
# CONFIG_44x is not set
# CONFIG_E500 is not set
# CONFIG_POWER3 is not set
# CONFIG_8xx is not set
# CONFIG_8260 is not set
# CONFIG_PQII is not set
CONFIG_PPC_STD_MMU=y
# CONFIG_EMBEDDED_OOM_KILLER is not set
# CONFIG_ALL_PPC is not set
# CONFIG_APUS is not set
```

```
# CONFIG_WILLOW is not set
# CONFIG_CPCI690 is not set
# CONFIG_PCORE is not set
# CONFIG_POWERPMC250 is not set
# CONFIG_PPMC260 is not set
# CONFIG_EV64260 is not set
# CONFIG_CHESTNUT is not set
# CONFIG_ARGAN is not set
# CONFIG_SPRUCE is not set
# CONFIG_MENF1 is not set
# CONFIG_PUMA_A is not set
CONFIG_ALASKA=y
# CONFIG_ICECUBE is not set
# CONFIG_HXEB100 is not set
# CONFIG_LOPEC is not set
# CONFIG_MCPN765 is not set
# CONFIG_MVME5100 is not set
# CONFIG_PPLUS is not set
# CONFIG_PRPMC750 is not set
# CONFIG_PRPMC800 is not set
# CONFIG_SANDPOINT is not set
# CONFIG_POWERK2 is not set
# CONFIG_ADIR is not set
# CONFIG_K2 is not set
# CONFIG_PAL4 is not set
# CONFIG_GEMINI is not set
# CONFIG_ZX4500 is not set
CONFIG_MPC8220_PSC_CONSOLE_PORT=0
CONFIG_MPC8220=y
CONFIG_NOT_COHERENT_CACHE=y
# CONFIG_SMP is not set
# CONFIG_PREEMPT is not set
CONFIG_IKCONFIG=y
CONFIG_IKCONFIG_PROC=y
# CONFIG_ALTIVEC is not set
# CONFIG_TAU is not set
CONFIG_PPC_ISATIMER=y

#
# General setup
#
CONFIG_MAX_POSIX_TIMERS=3000
# CONFIG_HIGH_RES_TIMERS is not set
# CONFIG_HIGHMEM is not set
# CONFIG_KERNEL_START_BOOL is not set
# CONFIG_TASK_SIZE_BOOL is not set
# CONFIG_ILATENCY is not set
# CONFIG_ISA is not set
# CONFIG_EISA is not set
# CONFIG_SBUS is not set
# CONFIG_MCA is not set
CONFIG_PCI=y
CONFIG_NET=y
```

```
CONFIG_SYSCTL=y
CONFIG_SYSVIPC=y
CONFIG_SYSVIPC_SEMMNI=128
CONFIG_SYSVIPC_SEMMSL=250
# CONFIG_BSD_PROCESS_ACCT is not set
CONFIG_MAX_USER_RT_PRIO=100
CONFIG_MAX_RT_PRIO=0
CONFIG_KCORE_ELF=y
CONFIG_BINFMT_ELF=y
CONFIG_MULTITHREADED_CORES=y
CONFIG_KERNEL_ELF=y
# CONFIG_BINFMT_MISC is not set
# CONFIG_PCI_NAMES is not set
CONFIG_HOTPLUG=y

#
# PCMCIA/CardBus support
#
# CONFIG_PCMCIA is not set

#
# Parallel port support
#
# CONFIG_PARPORT is not set
# CONFIG_PPC_RTC is not set
# CONFIG_CMDLINE_BOOL is not set

#
# Memory Technology Devices (MTD)
#
CONFIG_MTD=y
# CONFIG_MTD_DEBUG is not set
CONFIG_MTD_PARTITIONS=y
# CONFIG_MTD_CONCAT is not set
# CONFIG_MTD_REDBOOT_PARTS is not set
# CONFIG_MTD_CMDLINE_PARTS is not set
CONFIG_MTD_CHAR=y
CONFIG_MTD_BLOCK=y
# CONFIG_FTL is not set
# CONFIG_NFTL is not set
# CONFIG_INFTL is not set

#
# RAM/ROM/Flash chip drivers
#
CONFIG_MTD_CFI=y
# CONFIG_MTD_JEDECPROBE is not set
CONFIG_MTD_GEN_PROBE=y
CONFIG_MTD_CFI_ADV_OPTIONS=y
CONFIG_MTD_CFI_NOSWAP=y
# CONFIG_MTD_CFI_BE_BYTE_SWAP is not set
# CONFIG_MTD_CFI_LE_BYTE_SWAP is not set
CONFIG_MTD_CFI_GEOMETRY=y
```

```
CONFIG_MTD_MAP_BANK_WIDTH_1=y
# CONFIG_MTD_MAP_BANK_WIDTH_2 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_4 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_8 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_16 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_32 is not set
CONFIG_MTD_CFI_I1=y
# CONFIG_MTD_CFI_I2 is not set
# CONFIG_MTD_CFI_I4 is not set
# CONFIG_MTD_CFI_I8 is not set
CONFIG_MTD_CFI_INTELEXT=y
# CONFIG_MTD_CFI_AMDSTD is not set
# CONFIG_MTD_CFI_STAA is not set
CONFIG_MTD_CFI_UTIL=y
# CONFIG_MTD_RAM is not set
CONFIG_MTD_ROM=y
# CONFIG_MTD_ABSENT is not set
# CONFIG_MTD_OBSOLETE_CHIPS is not set
# CONFIG_MTD_AMDSTD is not set
# CONFIG_MTD_SHARP is not set
# CONFIG_MTD_JEDEC is not set


#
# Mapping drivers for chip access
#
CONFIG_MTD_COMPLEX_MAPPINGS=y
CONFIG_MTD_PHYSMAP=y
CONFIG_MTD_PHYSMAP_START=FE000000
CONFIG_MTD_PHYSMAP_LEN=01000000
CONFIG_MTD_PHYSMAP_BANKWIDTH=2
# CONFIG_MTD_PUMA_A is not set
# CONFIG_MTD_MOT_MVP is not set
# CONFIG_MTD_HXEB100 is not set
# CONFIG_MTD_PPMC260 is not set
# CONFIG_MTD_ARGAN is not set
# CONFIG_MTD_CHESTNUT is not set
# CONFIG_MTD_CPCI690 is not set
# CONFIG_MTD_PCI is not set
# CONFIG_MTD_PCMCIA is not set


#
# Self-contained MTD device drivers
#
# CONFIG_MTD_PMC551 is not set
# CONFIG_MTD_SLRAM is not set
# CONFIG_MTD_MTDRAM is not set
# CONFIG_MTD_BLKMTD is not set
# CONFIG_MTD_DOC2000 is not set
# CONFIG_MTD_DOC2001 is not set
# CONFIG_MTD_DOC2001PLUS is not set
# CONFIG_MTD_DOCPROBE is not set
# CONFIG_MTD_DOCECC is not set
# CONFIG_MTD_SFLASH is not set
```

```
#
# NAND Flash Device Drivers
#
# CONFIG_MTD_NAND is not set
# CONFIG_MTD_NAND_NONGENERIC is not set
# CONFIG_MTD_NAND_DISKONCHIP is not set


#
# Plug and Play configuration
#
# CONFIG_PNP is not set
# CONFIG_ISAPNP is not set


#
# Block devices
#
# CONFIG_BLK_DEV_FD is not set
# CONFIG_BLK_DEV_XD is not set
# CONFIG_PARIDE is not set
# CONFIG_BLK_CPQ_DA is not set
# CONFIG_BLK_CPQ_CISS_DA is not set
# CONFIG_CISS_SCSI_TAPE is not set
# CONFIG_BLK_DEV_DAC960 is not set
# CONFIG_BLK_DEV_UMEM is not set
CONFIG_BLK_DEV_LOOP=m
# CONFIG_BLK_DEV_NBD is not set
CONFIG_BLK_DEV_RAM=y
CONFIG_BLK_DEV_RAM_SIZE=12288
CONFIG_BLK_DEV_INITRD=y
# CONFIG_BLK_STATS is not set


#
# Multi-device support (RAID and LVM)
#
# CONFIG_MD is not set
# CONFIG_BLK_DEV_MD is not set
# CONFIG_MD_LINEAR is not set
# CONFIG_MD_RAID0 is not set
# CONFIG_MD_RAID1 is not set
# CONFIG_MD_RAID5 is not set
# CONFIG_MD_MULTIPATH is not set
# CONFIG_BLK_DEV_LVM is not set


#
# Cryptography support (CryptoAPI)
#
# CONFIG_CRYPTO is not set
# CONFIG_CIPHERS is not set
# CONFIG_DIGESTS is not set
# CONFIG_CRYPTODEV is not set
```

Initial RAM Disk

```
#
# Networking options
#
CONFIG_PACKET=y
# CONFIG_PACKET_MMAP is not set
# CONFIG_NETLINK_DEV is not set
CONFIG_NETFILTER=y
# CONFIG_NETFILTER_DEBUG is not set
# CONFIG_FILTER is not set
# CONFIG_NET_NEIGH_DEBUG is not set
# CONFIG_NET_RESTRICTED_REUSE is not set
CONFIG_UNIX=y
CONFIG_INET=y
# CONFIG_REUSEPORT is not set
# CONFIG_IPSEC is not set
CONFIG_IP_MULTICAST=y
# CONFIG_IP_ADVANCED_ROUTER is not set
# CONFIG_IP_PNP is not set
# CONFIG_NET_IPIP is not set
# CONFIG_NET_IPGRE is not set
# CONFIG_IP_MROUTE is not set
# CONFIG_ARPD is not set
# CONFIG_INET_ECN is not set
# CONFIG_SYN_COOKIES is not set
CONFIG_IPV4_IPSEC_TUNNEL=y

#
#   IP: Netfilter Configuration
#
# CONFIG_IP_NF_CONNTRACK is not set
# CONFIG_IP_NF_QUEUE is not set
# CONFIG_IP_NF_IPTABLES is not set
# CONFIG_IP_NF_ARPTABLES is not set
# CONFIG_IP_NF_COMPAT_IPCHAINS is not set
# CONFIG_IP_NF_COMPAT_IPFWADM is not set
CONFIG_IPV6=m
# CONFIG_IPV6_DEBUG is not set
# CONFIG_IPV6_IM is not set
# CONFIG_IPV6_ZONE is not set
# CONFIG_IPV6_DROP_FAKE_V4MAPPED is not set
# CONFIG_IPV6_6TO4_NEXTHOP is not set
# CONFIG_IPV6_PRIVACY is not set
# CONFIG_IPV6_ANYCAST is not set
# CONFIG_IPV6_ISATAP is not set
# CONFIG_IPV6_PREFIXLIST is not set
# CONFIG_IPV6_SUBTREES is not set
# CONFIG_IPV6_ROUTER_PREF is not set
# CONFIG_IPV6_MLD6_ALL_DONE is not set
# CONFIG_IPV6_NODEINFO is not set
```

```
#
#   IPv6: Netfilter Configuration
#
# CONFIG_IP6_NF_QUEUE is not set
# CONFIG_IP6_NF_IPTABLES is not set
CONFIG_IPV6_IPSEC_TUNNEL=y
# CONFIG_IPV6_IPV6_TUNNEL is not set
# CONFIG_IPV6_MOBILITY is not set
# CONFIG_KHTTPD is not set
# CONFIG_ATM is not set
# CONFIG_VLAN_8021Q is not set
# CONFIG_IPX is not set
# CONFIG_ATALK is not set


#
# Appletalk devices
#
# CONFIG_DEV_APPLETALK is not set
# CONFIG_DECNET is not set
# CONFIG_BRIDGE is not set
# CONFIG_X25 is not set
# CONFIG_LAPB is not set
# CONFIG_LLC is not set
# CONFIG_NET_DIVERT is not set
# CONFIG_ECONET is not set
# CONFIG_WAN_ROUTER is not set
# CONFIG_NET_FASTROUTE is not set
# CONFIG_NET_HW_FLOWCONTROL is not set


#
# QoS and/or fair queueing
#
# CONFIG_NET_SCHED is not set


#
# Network testing
#
# CONFIG_NET_PKTGEN is not set


#
# ATA/IDE/MFM/RLL support
#
CONFIG_IDE=m


#
# IDE, ATA and ATAPI Block devices
#
CONFIG_BLK_DEV_IDE=m
# CONFIG_BLK_DEV_HD_IDE is not set
# CONFIG_BLK_DEV_HD is not set
CONFIG_BLK_DEV_IDEDISK=m
# CONFIG_IDEDISK_MULTI_MODE is not set
# CONFIG_IDEDISK_STROKE is not set
```

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```
# CONFIG_BLK_DEV_IDEDISK_VENDOR is not set
# CONFIG_BLK_DEV_IDEDISK_FUJITSU is not set
# CONFIG_BLK_DEV_IDEDISK_IBM is not set
# CONFIG_BLK_DEV_IDEDISK_MAXTOR is not set
# CONFIG_BLK_DEV_IDEDISK_QUANTUM is not set
# CONFIG_BLK_DEV_IDEDISK_SEAGATE is not set
# CONFIG_BLK_DEV_IDEDISK_WD is not set
# CONFIG_BLK_DEV_COMMERIAL is not set
# CONFIG_BLK_DEV_TIVO is not set
# CONFIG_BLK_DEV_IDECS is not set
CONFIG_BLK_DEV_IDECD=m
# CONFIG_BLK_DEV_IDETAPE is not set
# CONFIG_BLK_DEV_IDEFLOPPY is not set
# CONFIG_BLK_DEV_IDESCSI is not set
# CONFIG_IDE_TASK_IOCTL is not set
# CONFIG_BLK_DEV_CMD640 is not set
# CONFIG_BLK_DEV_CMD640_ENHANCED is not set
# CONFIG_BLK_DEV_ISAPNP is not set
# CONFIG_BLK_DEV_RZ1000 is not set
CONFIG_BLK_DEV_IDEPCI=y
# CONFIG_IDEPCI_SHARE_IRQ is not set
CONFIG_BLK_DEV_IDEDMA_PCI=y
# CONFIG_BLK_DEV_OFFBOARD is not set
# CONFIG_BLK_DEV_IDEDMA_FORCED is not set
CONFIG_IDEDMA_PCI_AUTO=y
# CONFIG_IDEDMA_ONLYDISK is not set
CONFIG_BLK_DEV_IDEDMA=y
# CONFIG_IDEDMA_PCI_WIP is not set
# CONFIG_BLK_DEV_IDEDMA_TIMEOUT is not set
# CONFIG_IDEDMA_NEW_DRIVE_LISTINGS is not set
CONFIG_BLK_DEV_ADMA=y
# CONFIG_BLK_DEV_AEC62XX is not set
# CONFIG_AEC62XX_TUNING is not set
# CONFIG_BLK_DEV_ALI15X3 is not set
# CONFIG_WDC_ALI15X3 is not set
# CONFIG_BLK_DEV_AMD74XX is not set
# CONFIG_AMD74XX_OVERRIDE is not set
# CONFIG_BLK_DEV_CMD64X is not set
# CONFIG_BLK_DEV_SII_680 is not set
# CONFIG_BLK_DEV_CY82C693 is not set
# CONFIG_BLK_DEV_CS5530 is not set
# CONFIG_BLK_DEV_CS5535 is not set
# CONFIG_BLK_DEV_HPT34X is not set
# CONFIG_HPT34X_AUTODMA is not set
# CONFIG_BLK_DEV_HPT366 is not set
# CONFIG_BLK_DEV_HPT371 is not set
# CONFIG_BLK_DEV_NS87415 is not set
# CONFIG_BLK_DEV_OPTI621 is not set
CONFIG_BLK_DEV_PDC202XX=y
CONFIG_PDC202XX_BURST=y
# CONFIG_PDC202XX_FORCE is not set
# CONFIG_BLK_DEV_SVWKS is not set
# CONFIG_BLK_DEV_SIS5513 is not set
```

```
# CONFIG_BLK_DEV_SLC90E66 is not set
# CONFIG_BLK_DEV_TRM290 is not set
# CONFIG_BLK_DEV_VIA82CXXX is not set
# CONFIG_BLK_DEV_SL82C105 is not set
# CONFIG_BLK_DEV_XILLEON is not set
# CONFIG_BLK_DEV_TC86C001 is not set
# CONFIG_IDE_CHIPSETS is not set
CONFIG_IDEDMA_AUTO=y
# CONFIG_IDEDMA_IVB is not set
# CONFIG_DMA_NONPCI is not set
CONFIG_BLK_DEV_IDE_MODES=y
# CONFIG_BLK_DEV_ATARAID is not set
# CONFIG_BLK_DEV_ATARAID_PDC is not set
# CONFIG_BLK_DEV_ATARAID_HPT is not set


#
# SCSI support
#
CONFIG_SCSI=m
CONFIG_BLK_DEV_SD=m
CONFIG_SD_EXTRA_DEVS=40
# CONFIG_CHR_DEV_ST is not set
# CONFIG_CHR_DEV_OSST is not set
# CONFIG_BLK_DEV_SR is not set
CONFIG_CHR_DEV_SG=m
# CONFIG_SCSI_DEBUG_QUEUES is not set
# CONFIG_SCSI_MULTI_LUN is not set
# CONFIG_SCSI_CONSTANTS is not set
# CONFIG_SCSI_LOGGING is not set


#
# SCSI low-level drivers
#
# CONFIG_BLK_DEV_3W_XXXX_RAID is not set
# CONFIG_SCSI_7000FASST is not set
# CONFIG_SCSI_ACARD is not set
# CONFIG_SCSI_AHA152X is not set
# CONFIG_SCSI_AHA1542 is not set
# CONFIG_SCSI_AHA1740 is not set
# CONFIG_SCSI_AACRAID is not set
# CONFIG_SCSI_AIC7XXX is not set
# CONFIG_SCSI_AIC79XX is not set
# CONFIG_SCSI_AIC7XXX_OLD is not set
# CONFIG_SCSI_DPT_I2O is not set
# CONFIG_SCSI_ADVANSYS is not set
# CONFIG_SCSI_IN2000 is not set
# CONFIG_SCSI_AM53C974 is not set
# CONFIG_SCSI_MEGARAID is not set
# CONFIG_SCSI_BUSLOGIC is not set
# CONFIG_SCSI_CPQFCTS is not set
# CONFIG_SCSI_DMX3191D is not set
# CONFIG_SCSI_DTC3280 is not set
# CONFIG_SCSI_EATA is not set
```

```
# CONFIG_SCSI_EATA_DMA is not set
# CONFIG_SCSI_EATA_PIO is not set
# CONFIG_SCSI_FUTURE_DOMAIN is not set
# CONFIG_SCSI_GDTH is not set
# CONFIG_SCSI_GENERIC_NCR5380 is not set
# CONFIG_SCSI_INITIO is not set
# CONFIG_SCSI_INIA100 is not set
# CONFIG_SCSI_NCR53C406A is not set
# CONFIG_SCSI_NCR53C7xx is not set
# CONFIG_SCSI_SYM53C8XX_2 is not set
# CONFIG_SCSI_NCR53C8XX is not set
# CONFIG_SCSI_SYM53C8XX is not set
# CONFIG_SCSI_PAS16 is not set
# CONFIG_SCSI_PCI2000 is not set
# CONFIG_SCSI_PCI2220I is not set
# CONFIG_SCSI_PSI240I is not set
# CONFIG_SCSI_QLOGIC_FAS is not set
# CONFIG_SCSI_QLOGIC_ISP is not set
# CONFIG_SCSI_QLOGIC_FC is not set
# CONFIG_SCSI_QLOGIC_1280 is not set
# CONFIG_SCSI_QLOGIC_23XX is not set
# CONFIG_SCSI_SIM710 is not set
# CONFIG_SCSI_SYM53C416 is not set
# CONFIG_SCSI_DC390T is not set
# CONFIG_SCSI_T128 is not set
# CONFIG_SCSI_U14_34F is not set
# CONFIG_SCSI_DEBUG is not set


#
# Fusion MPT device support
#
# CONFIG_FUSION is not set
# CONFIG_FUSION_BOOT is not set
# CONFIG_FUSION_ISENSE is not set
# CONFIG_FUSION_CTL is not set
# CONFIG_FUSION_LAN is not set


#
# IEEE 1394 (FireWire) support (EXPERIMENTAL)
#
# CONFIG_IEEE1394 is not set


#
# I2O device support
#
# CONFIG_I2O is not set
# CONFIG_I2O_PCI is not set
# CONFIG_I2O_BLOCK is not set
# CONFIG_I2O_LAN is not set
# CONFIG_I2O_SCSI is not set
# CONFIG_I2O_PROC is not set
```

```
#
# Network device support
#
CONFIG_NETDEVICES=y

#
# Broadcom network devices
#
# CONFIG_HND is not set

#
# ARCnet devices
#
# CONFIG_ARCNET is not set
# CONFIG_DUMMY is not set
# CONFIG_BONDING is not set
# CONFIG_EQUALIZER is not set
# CONFIG_IMQ is not set
CONFIG_TUN=m
# CONFIG_ETHERTAP is not set

#
# Ethernet (10 or 100Mbit)
#
CONFIG_NET_ETHERNET=y
# CONFIG_MACE is not set
# CONFIG_BMAC is not set
# CONFIG_GMAC is not set
# CONFIG_SUNLANCE is not set
# CONFIG_HAPPYMEAL is not set
# CONFIG_SUNBMAC is not set
# CONFIG_SUNQE is not set
# CONFIG_SUNGEM is not set
# CONFIG_NET_VENDOR_3COM is not set
# CONFIG_LANCE is not set
# CONFIG_NET_VENDOR_SMC is not set
# CONFIG_NET_VENDOR_RACAL is not set
# CONFIG_HP100 is not set
# CONFIG_NET_ISA is not set
CONFIG_NET_PCI=y
# CONFIG_PCNET32 is not set
# CONFIG_ADAPTEC_STARFIRE is not set
# CONFIG_APRICOT is not set
CONFIG_TULIP=m
# CONFIG_TULIP_MWI is not set
# CONFIG_TULIP_MMIO is not set
# CONFIG_DE4X5 is not set
# CONFIG_DGRS is not set
# CONFIG_DM9102 is not set
# CONFIG_EEPRO100 is not set
# CONFIG_E100 is not set
# CONFIG_E100_DIAG is not set
```

```
# CONFIG_LNE390 is not set
# CONFIG_FEALNX is not set
CONFIG_NATSEMI=m
# CONFIG_NE2K_PCI is not set
# CONFIG_NE3210 is not set
# CONFIG_ES3210 is not set
# CONFIG_8139CP is not set
# CONFIG_8139TOO is not set
# CONFIG_8139TOO_PIO is not set
# CONFIG_8139TOO_TUNE_TWISTER is not set
# CONFIG_8139TOO_8129 is not set
# CONFIG_8139_OLD_RX_RESET is not set
# CONFIG_SIS900 is not set
# CONFIG_EPIC100 is not set
# CONFIG_SUNDANCE is not set
# CONFIG_SUNDANCE_MMIO is not set
# CONFIG_TLAN is not set
# CONFIG_TC35815 is not set
# CONFIG_VIA_RHINE is not set
# CONFIG_VIA_RHINE_MMIO is not set
# CONFIG_WINBOND_840 is not set
# CONFIG_CS89x0 is not set
# CONFIG_NET_POCKET is not set
# CONFIG_MVNET is not set

#
# Ethernet (1000 Mbit)
#
# CONFIG_ACENIC is not set
# CONFIG_DL2K is not set
# CONFIG_E1000 is not set
# CONFIG_E1000_DIAG is not set
# CONFIG_MYRI_SBUS is not set
# CONFIG_NS83820 is not set
# CONFIG_HAMACHI is not set
# CONFIG_YELLOWFIN is not set
# CONFIG_SK98LIN is not set
# CONFIG_NET_BROADCOM is not set
# CONFIG_TIGON3 is not set
# CONFIG_GIANFAR is not set
# CONFIG_GFAR_NAPI is not set
# CONFIG_GFAR_BDSTASH is not set
# CONFIG_GFAR_BUFSTASH is not set
# CONFIG_FDDI is not set
# CONFIG_HIPPI is not set
# CONFIG_PLIP is not set
CONFIG_PPP=m
# CONFIG_PPP_MULTILINK is not set
# CONFIG_PPP_FILTER is not set
CONFIG_PPP_ASYNC=m
CONFIG_PPP_SYNC_TTY=m
CONFIG_PPP_DEFLATE=m
```

```
# CONFIG_PPP_BSDCOMP is not set
# CONFIG_PPPOE is not set
# CONFIG_SLIP is not set


#
# Wireless LAN (non-hamradio)
#
# CONFIG_NET_RADIO is not set


#
# Token Ring devices
#
# CONFIG_TR is not set
# CONFIG_NET_FC is not set
# CONFIG_RCPCI is not set
# CONFIG_SHAPER is not set


#
# Wan interfaces
#
# CONFIG_WAN is not set


#
# Amateur Radio support
#
# CONFIG_HAMRADIO is not set


#
# IrDA (infrared) support
#
# CONFIG_IRDA is not set


#
# ISDN subsystem
#
# CONFIG_ISDN is not set


#
# Old CD-ROM drivers (not SCSI, not IDE)
#
# CONFIG_CD_NO_IDESCSI is not set


#
# Console drivers
#
# CONFIG_VGA_CONSOLE is not set


#
# Frame-buffer support
#
# CONFIG_FB is not set
```

```
#
# Input core support
#
CONFIG_INPUT=m
CONFIG_INPUT_KEYBDEV=m
CONFIG_INPUT_MOUSEDEV=m
CONFIG_INPUT_MOUSEDEV_SCREEN_X=1024
CONFIG_INPUT_MOUSEDEV_SCREEN_Y=768
# CONFIG_INPUT_JOYDEV is not set
CONFIG_INPUT_EVDEV=m

#
# Macintosh device drivers
#

#
# Character devices
#
# CONFIG_VT is not set
# CONFIG_SERIAL is not set
# CONFIG_SERIAL_EXTENDED is not set
# CONFIG_SERIAL_NONSTANDARD is not set

#
# Serial drivers
#
# CONFIG_SERIAL_8250 is not set
# CONFIG_SERIAL_8250_CONSOLE is not set
# CONFIG_SERIAL_8250_EXTENDED is not set
# CONFIG_SERIAL_8250_MANY_PORTS is not set
# CONFIG_SERIAL_8250_SHARE_IRQ is not set
# CONFIG_SERIAL_8250_DETECT_IRQ is not set
# CONFIG_SERIAL_8250_MULTIPORT is not set
# CONFIG_SERIAL_8250_HUB6 is not set
CONFIG_UNIX98_PTYS=y
CONFIG_UNIX98_PTY_COUNT=256
# CONFIG_IXP2000_SLAVE is not set

#
# I2C support
#
# CONFIG_I2C is not set

#
# Mice
#
# CONFIG_BUSMOUSE is not set
# CONFIG_MOUSE is not set
```

```
#
# Joysticks
#
# CONFIG_INPUT_GAMEPORT is not set
# CONFIG_INPUT_NS558 is not set
# CONFIG_INPUT_LIGHTNING is not set
# CONFIG_INPUT_PCIGAME is not set
# CONFIG_INPUT_CS461X is not set
# CONFIG_INPUT_EMU10K1 is not set
# CONFIG_INPUT_SERIO is not set
# CONFIG_INPUT_SERPORT is not set
# CONFIG_INPUT_ANALOG is not set
# CONFIG_INPUT_A3D is not set
# CONFIG_INPUT_ADI is not set
# CONFIG_INPUT_COBRA is not set
# CONFIG_INPUT_GF2K is not set
# CONFIG_INPUT_GRIP is not set
# CONFIG_INPUT_INTERACT is not set
# CONFIG_INPUT_TMDC is not set
# CONFIG_INPUT_SIDEWINDER is not set
# CONFIG_INPUT_IFORCE_USB is not set
# CONFIG_INPUT_IFORCE_232 is not set
# CONFIG_INPUT_WARRIOR is not set
# CONFIG_INPUT_MAGELLAN is not set
# CONFIG_INPUT_SPACEORB is not set
# CONFIG_INPUT_SPACEBALL is not set
# CONFIG_INPUT_STINGER is not set
# CONFIG_INPUT_DB9 is not set
# CONFIG_INPUT_GAMECON is not set
# CONFIG_INPUT_TURBOGRAFX is not set
# CONFIG_QIC02_TAPE is not set


#
# Watchdog Cards
#
# CONFIG_WATCHDOG is not set
# CONFIG_LINUX_LED is not set
# CONFIG_CPCI735_LED is not set
# CONFIG_AMD_PM768 is not set
# CONFIG_NVRAM is not set
# CONFIG_RTC is not set
# CONFIG_DTLK is not set
# CONFIG_R3964 is not set
# CONFIG_APPLICOM is not set


#
# Ftape, the floppy tape device driver
#
# CONFIG_FTAPE is not set
# CONFIG_AGP is not set
# CONFIG_DRM is not set
# CONFIG_DEVSOC is not set
```

```
#
# Multimedia devices
#
# CONFIG_VIDEO_DEV is not set

#
# File systems
#
# CONFIG_QUOTA is not set
# CONFIG_QFMT_V1 is not set
# CONFIG_QFMT_V2 is not set
# CONFIG_QIFACE_COMPAT is not set
# CONFIG_AUTOFS_FS is not set
CONFIG_AUTOFS4_FS=y
CONFIG_REISERFS_FS=m
# CONFIG_REISERFS_CHECK is not set
# CONFIG_REISERFS_PROC_INFO is not set
# CONFIG_ADFS_FS is not set
# CONFIG_ADFS_FS_RW is not set
# CONFIG_AFFS_FS is not set
# CONFIG_HFS_FS is not set
# CONFIG_BEFS_FS is not set
# CONFIG_BEFS_DEBUG is not set
# CONFIG_BFS_FS is not set
CONFIG_EXT3_FS=m
CONFIG_JBD=m
# CONFIG_JBD_DEBUG is not set
CONFIG_FAT_FS=m
CONFIG_MSDOS_FS=m
CONFIG_UMSDOS_FS=m
CONFIG_VFAT_FS=m
# CONFIG_EFS_FS is not set
# CONFIG_JFFS_FS is not set
CONFIG_JFFS2_FS=y
CONFIG_JFFS2_FS_DEBUG=0
# CONFIG_JFFS2_FS_NAND is not set
# CONFIG_JFFS2_ZLIB is not set
# CONFIG_JFFS2_RTIME is not set
# CONFIG_JFFS2_RUBIN is not set
# CONFIG_JFFS2_LZO is not set
# CONFIG_JFFS2_LZARI is not set
# CONFIG_JFFS2_CMODE_NONE is not set
CONFIG_JFFS2_CMODE_PRIORITY=y
# CONFIG_JFFS2_CMODE_SIZE is not set
# CONFIG_JFFS2_PROC is not set
CONFIG_CRAMFS=y
# CONFIG_POSIX_MQUEUE_FS is not set
CONFIG_TMPFS=y
CONFIG_RAMFS=y
CONFIG_ISO9660_FS=m
CONFIG_JOLIET=y
# CONFIG_ZISOFS is not set
```

```
# CONFIG_JFS_FS is not set
# CONFIG_JFS_DEBUG is not set
# CONFIG_JFS_STATISTICS is not set
# CONFIG_MINIX_FS is not set
# CONFIG_VXFS_FS is not set
# CONFIG_NTFS_FS is not set
# CONFIG_NTFS_RW is not set
# CONFIG_HPFS_FS is not set
CONFIG_PROC_FS=y
CONFIG_DEVFS_FS=y
CONFIG_DEVFS_MOUNT=y
# CONFIG_DEVFS_DEBUG is not set
CONFIG_DEVPTS_FS=y
# CONFIG_QNX4FS_FS is not set
# CONFIG_QNX4FS_RW is not set
CONFIG_ROMFS_FS=y
CONFIG_EXT2_FS=y
# CONFIG_SYSV_FS is not set
CONFIG_UDF_FS=m
# CONFIG_UDF_RW is not set
CONFIG_UFS_FS=m
# CONFIG_UFS_FS_WRITE is not set
CONFIG_XFS_FS=m
# CONFIG_XFS_POSIX_ACL is not set
# CONFIG_XFS_RT is not set
# CONFIG_XFS_QUOTA is not set
# CONFIG_XFS_DMAPI is not set
# CONFIG_XFS_DEBUG is not set
# CONFIG_PAGEBUF_DEBUG is not set

#
# Network File Systems
#
# CONFIG_CODA_FS is not set
# CONFIG_INTERMEZZO_FS is not set
CONFIG_NFS_FS=y
CONFIG_NFS_V3=y
# CONFIG_ROOT_NFS is not set
CONFIG_NFSD=m
CONFIG_NFSD_V3=y
# CONFIG_NFSD_TCP is not set
CONFIG_SUNRPC=y
CONFIG_LOCKD=y
CONFIG_LOCKD_V4=y
CONFIG_SMB_FS=m
# CONFIG_SMB_NLS_DEFAULT is not set
# CONFIG_NCP_FS is not set
# CONFIG_NCPFS_PACKET_SIGNING is not set
# CONFIG_NCPFS_IOCTL_LOCKING is not set
# CONFIG_NCPFS_STRONG is not set
# CONFIG_NCPFS_NFS_NS is not set
# CONFIG_NCPFS_OS2_NS is not set
# CONFIG_NCPFS_SMALLDOS is not set
```

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```
# CONFIG_NCPFS_NLS is not set
# CONFIG_NCPFS_EXTRAS is not set
# CONFIG_ZISOFS_FS is not set


#
# Partition Types
#
# CONFIG_PARTITION_ADVANCED is not set
CONFIG_MSDOS_PARTITION=y
CONFIG_SMB_NLS=y
CONFIG_NLS=y


#
# Native Language Support
#
CONFIG_NLS_DEFAULT="iso8859-1"
# CONFIG_NLS_CODEPAGE_437 is not set
# CONFIG_NLS_CODEPAGE_737 is not set
# CONFIG_NLS_CODEPAGE_775 is not set
# CONFIG_NLS_CODEPAGE_850 is not set
# CONFIG_NLS_CODEPAGE_852 is not set
# CONFIG_NLS_CODEPAGE_855 is not set
# CONFIG_NLS_CODEPAGE_857 is not set
# CONFIG_NLS_CODEPAGE_860 is not set
# CONFIG_NLS_CODEPAGE_861 is not set
# CONFIG_NLS_CODEPAGE_862 is not set
# CONFIG_NLS_CODEPAGE_863 is not set
# CONFIG_NLS_CODEPAGE_864 is not set
# CONFIG_NLS_CODEPAGE_865 is not set
# CONFIG_NLS_CODEPAGE_866 is not set
# CONFIG_NLS_CODEPAGE_869 is not set
# CONFIG_NLS_CODEPAGE_936 is not set
# CONFIG_NLS_CODEPAGE_950 is not set
# CONFIG_NLS_CODEPAGE_932 is not set
# CONFIG_NLS_CODEPAGE_949 is not set
# CONFIG_NLS_CODEPAGE_874 is not set
# CONFIG_NLS_ISO8859_8 is not set
# CONFIG_NLS_CODEPAGE_1250 is not set
# CONFIG_NLS_CODEPAGE_1251 is not set
# CONFIG_NLS_ISO8859_1 is not set
# CONFIG_NLS_ISO8859_2 is not set
# CONFIG_NLS_ISO8859_3 is not set
# CONFIG_NLS_ISO8859_4 is not set
# CONFIG_NLS_ISO8859_5 is not set
# CONFIG_NLS_ISO8859_6 is not set
# CONFIG_NLS_ISO8859_7 is not set
# CONFIG_NLS_ISO8859_9 is not set
# CONFIG_NLS_ISO8859_13 is not set
# CONFIG_NLS_ISO8859_14 is not set
# CONFIG_NLS_ISO8859_15 is not set
# CONFIG_NLS_KOI8_R is not set
# CONFIG_NLS_KOI8_U is not set
# CONFIG_NLS_UTF8 is not set
```

```
#
# Sound
#
# CONFIG_SOUND is not set

#
# MPC8220 I/O Options
#
CONFIG_PPC_8220_PSC=y
CONFIG_PPC_8220_PSC_CONSOLE=y
CONFIG_SERIAL_CONSOLE=y
CONFIG_BESTDMA=y
CONFIG_ALASKA_FEC=y
CONFIG_ALASKA_1284=m
CONFIG_ALASKA_1284_DMA=y

#
# USB support
#
CONFIG_USB=m
# CONFIG_USB_DEBUG is not set
CONFIG_USB_DEVICEFS=y
# CONFIG_USB_BANDWIDTH is not set
CONFIG_USB_LONG_TIMEOUT=y
# CONFIG_USB_EHCI_HCD is not set
# CONFIG_USB_MX2_OTG is not set
# CONFIG_USB_MX2_HCD is not set
# CONFIG_USB_UHCI is not set
# CONFIG_USB_UHCI_ALT is not set
CONFIG_USB_OHCI=m
# CONFIG_USB_NON_PCI_OHCI is not set
CONFIG_USB_OHCI_MPC8220I=m
# CONFIG_USB_AUDIO is not set
# CONFIG_USB_EMI26 is not set
# CONFIG_USB_BLUETOOTH is not set
# CONFIG_USB_MIDI is not set
CONFIG_USB_STORAGE=m
CONFIG_USB_STORAGE_DEBUG=y
CONFIG_USB_STORAGE_DATAFAB=y
# CONFIG_USB_STORAGE_FREECOM is not set
CONFIG_USB_STORAGE_ISD200=y
CONFIG_USB_STORAGE_DPCM=y
# CONFIG_USB_STORAGE_HP8200e is not set
CONFIG_USB_STORAGE_SDDR09=y
CONFIG_USB_STORAGE_SDDR55=y
CONFIG_USB_STORAGE_JUMPSHOT=y
# CONFIG_USB_ACM is not set
CONFIG_USB_PRINTER=m
CONFIG_USB_HID=m
CONFIG_USB_HIDINPUT=y
# CONFIG_USB_HIDDEV is not set
# CONFIG_USB_KBD is not set
# CONFIG_USB_MOUSE is not set
```

```
# CONFIG_USB_AIPTEK is not set
# CONFIG_USB_WACOM is not set
# CONFIG_USB_DC2XX is not set
# CONFIG_USB_MDC800 is not set
# CONFIG_USB_SCANNER is not set
# CONFIG_USB_MICROTEK is not set
# CONFIG_USB_HPUSBSCSI is not set
# CONFIG_USB_PEGASUS is not set
# CONFIG_USB_RTL8150 is not set
# CONFIG_USB_KAWETH is not set
# CONFIG_USB_CATC is not set
# CONFIG_USB_CDCETHER is not set
# CONFIG_USB_USBNET is not set
# CONFIG_USB_USS720 is not set

#
# USB Serial Converter support
#
# CONFIG_USB_SERIAL is not set
# CONFIG_USB_RIO500 is not set
# CONFIG_USB_AUERSWALD is not set
# CONFIG_USB_TIGL is not set
# CONFIG_USB_BRLVGER is not set
# CONFIG_USB_LCD is not set

#
# USB Device Support
#
CONFIG_USBD=m
CONFIG_USBD_VENDORID=0000
CONFIG_USBD_PRODUCTID=0000
CONFIG_USBD_PRODUCT_NAME="Yukon"
CONFIG_USBD_MANUFACTURER="Freescale"
# CONFIG_USBD_USE_SERIAL_NUMBER is not set
# CONFIG_USBD_SELFPOWERED is not set
CONFIG_USBD_MAXPOWER=0
# CONFIG_USBD_EP0_SUPPORT is not set
# CONFIG_USBD_MONITOR is not set
# CONFIG_USBD_PROCFS is not set
CONFIG_ALASKA_USB=m
CONFIG_ALASKA_USB_DMA=y
# CONFIG_USBD_M8xx_TTY is not set
# CONFIG_USBD_PQ2_TTY is not set

#
# Network Function
#
# CONFIG_USBD_NET is not set

#
# Serial Function
#
# CONFIG_USBD_SERIAL is not set
```

```
#
# Mouse Function
#
# CONFIG_USBD_MOUSE is not set

#
# Mass Storage Function
#
# CONFIG_USBD_STORAGE is not set

#
# EP0 test Function
#
# CONFIG_USBD_TEST is not set

#
# USB Device Bus Interface Support
#
# CONFIG_USBD_GENERIC_BUS is not set

#
# Bluetooth support
#
# CONFIG_BLUEZ is not set

#
# Kernel tracing
#
# CONFIG_TRACE is not set
# CONFIG_TRACE_BOOT is not set

#
# Library routines
#
CONFIG_ZLIB_INFLATE=y
CONFIG_ZLIB_DEFLATE=m

#
# Kernel hacking
#
# CONFIG_DEBUG_KERNEL is not set
# CONFIG_SERIAL_TEXT_DEBUG is not set
```

5   Hard Disk Drive

The purpose of this section is to configure the Linux kernel to use a common hard disk drive for its file system. This has the benefit of being much larger than a Flash drive, thus allowing a full-fledged filesystem to be stored. It also means that it can have the native compiler and many other utilities stored locally on the target.

5.1   Prerequisites

This will require the hard disk drive and the disk controller card described in Section 1, "Introduction. Compatible hardware may be substituted for the examples given, but additional kernel driver modules will be required. It's best to choose from the list of supported hardware and/or available drivers as shown in the `menuconfig`. Otherwise, the kernel must first be reconfigured for the Integrated Device Electronics (IDE, or ATA) and disk controller drivers matching the chosen hardware. Using the given hardware, install the Promise Disk Controller (PDC) into the PCI bus and connect the 40-pin, 80-wire ribbon cable from its primary channel (IDE/ATA-0) with the master (end) connector to the hard disk drive in the proper orientation. The blue end usually connects to the disk controller or motherboard. Don't forget to run the molex power cable to the hard disk drive as well.

5.2   Procedure

Steps in Section 5.2.2, "Build the Kernel through Section 5.2.6, "Copy Filesystem to Hard Drive are done on the target with the default NFS root filesystem, described in Section 3, "Network File System (Default). Since it was not configured to boot off-board chipsets first, the first hard drive letter for the master disk on the primary channel of the PCI ATA controller card starts as `hde` instead of `hda`, and all subsequent `hd*` drive names increment up through the alphabet. By the step in Section 5.2.8, "Set U-Boot Bootargs and Boot, the target will be using the newly compiled Linux image for the hard drive root filesystem, which is set to boot off-board chipsets first. In this case, the first hard drive letter for the master disk on the primary channel of the PCI ATA controller card is `hda` and all subsequent `hd*` drive names increment from that. If the user chooses to connect the hard disk drive to the host, then he can skip the step in Section 5.2.3, "Create Device Node Files for Hard Drives and perform the steps in Section 5.2.4, "Run Hard Disk Configuration through Section 5.2.6, "Copy Filesystem to Hard Drive on the host before installing the disk on the target.

5.2.1   Configure the Kernel

Since the user may not have the proper kernel driver modules configured, this section shows how to reconfigure the kernel with `menuconfig` for hard disk drive usage. Note the similarity to the INITRD discussion on `menuconfig` in Section 4.3, "Configuration Files. When options for IDE are enabled, more suboptions become available to the user.

```
user@FC3:1> cd mykernel
user@FC3:2> make menuconfig
```

- In `menuconfig`, set the following parameters:

```
ATA/IDE/MFM/RLL support: <enable ATA/IDE/MFM/RLL support>
IDE, ATA and ATAPI Block devices:
<enable Enhanced IDE/MFM/RLL disk/cdrom/tape/floppy support>
<enable Include IDE/ATA-2 DISK support>
<enable Generic PCI IDE chipset support>
<enable Generic PCI bus-master DMA support>
<enable Boot off-board chipsets first support>
```

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```
        <enable Use PCI DMA by default when available>
    <enable PROMISE PDC202{46|62|65|67|68|69|70} support>
          <enable Special UDMA Feature>
    File systems: <enable Second extended fs support>
    General Setup: <disable Default bootloader kernel arguments>
```

- When complete, select and enter:

```
    < Exit >
    Do you wish to save your new kernel configuration?
    < Yes >
    Your kernel configuration changes were saved.
```

5.2.2   Build the Kernel

Since the initial procedures prepared MVL for building, only the dependencies and modules must be updated. But if that task was skipped, return to Section 3.2, "Building for review.

```
        user@FC3:3> cd mykernel/linux-2.4.20_mvl31
        user@FC3:4> make clean
        user@FC3:5> make dep
        user@FC3:6> make modules
        root@FC3:7> make modules_install
        user@FC3:8> make uImage
        user@FC3:9> cp arch/ppc/boot/images/uImage /tftpboot/mvl5.umg
```

5.2.3   Create Device Node Files for Hard Drives

Without the proper device node files, Linux is incapable of accessing the hard disk drive. The MAKEDEV script generates a particular set of device node files. In this case, only those needed for hard drives are generated, since only hd was specified. Check that the device node files have been created properly by listing the files in the /dev directory. This procedure must be done each time a new drive is added to the system, because the files do not persist after a reboot unless they are attached to an active disk.

```
        root@Yukon:/# cd /dev
        root@Yukon:/dev# MAKEDEV hd
```

- An error like the following is output when the device node file which references the hard disk drive is not available.

```
        Unable to open /dev/hde
```

5.2.4   Run Hard Disk Configuration

The hard disk drive parameters can be configured to function with Linux with fdisk. There are many different types of filesystems it can use, but for best compatibility, choose Linux Second Extended

Filesystem. Note that multiple different partitions could be created using `fdisk`, but only one is necessary for the basic hard disk drive filesystem set up.

```
root@Yukon:/# fdisk /dev/hde


Uniform Multi-Platform E-IDE driver Revision: 6.31
ide: Assuming 33MHz system bus speed for PIO modes; override
with idebus=xx
PDC20269: IDE controller on PCI bus 00 dev a0
PDC20269: chipset revision 2
PDC20269: not 100% native mode: will probe irqs later
PDC20269: ROM enabled at 0x000dc000
    ide2: BM-DMA at 0x81ffffd0-0x81ffffd7, BIOS settings:
hde:pio, hdf:pio
    ide3: BM-DMA at 0x81ffffd8-0x81ffffdf, BIOS settings:
hdg:pio, hdh:pio
hde: Maxtor 83201A6, ATA DISK drive
hdf: probing with STATUS(0x00) instead of ALTSTATUS(0x50)
hdf: probing with STATUS(0x00) instead of ALTSTATUS(0x50)
ide2 at 0x81fffff8-0x81ffffff,0x81fffff6 on irq 68
blk: queue e1025a68, I/O limit 4095Mb (mask 0xffffffff)
hde: 6267744 sectors (3209 MB) w/256KiB Cache, CHS=6218/16/63,
DMA
Partition check:
 /dev/ide/host2/bus0/target0/lun0: [PTBL] [777/128/63] p1 p2
< p5 p6 p7 p8 p9 >
```

- At the `fdisk` program interface, input the following commands as shown:

```
Command (m for help): m
Command action
   a   toggle a bootable flag
   b   edit bsd disklabel
   c   toggle the dos compatibility flag
   d   delete a partition
   l   list known partition types
   m   print this menu
   n   add a new partition
   o   create a new empty DOS partition table
   p   print the partition table
```

```
      q    quit without saving changes
      s    create a new empty Sun disklabel
      t    change a partition's system id
      u    change display/entry units
      v    verify the partition table
      w    write table to disk and exit
      x    extra functionality (experts only)
```

Command (m for help): p

```
Disk /dev/hde: 128 heads, 63 sectors, 777 cylinders
Units = cylinders of 8064 * 512 bytes

   Device Boot      Start        End      Blocks   Id  System
/dev/hde1    *          1        127      512032+  83  Linux
/dev/hde2             128        777     2620800    5  Extended
/dev/hde5             128        254      512032+  83  Linux
/dev/hde6             255        331      310432+  83  Linux
/dev/hde7             332        408      310432+  83  Linux
/dev/hde8             409        485      310432+  82  Linux swap
/dev/hde9             486        777     1177312+  83  Linux
```

Command (m for help): d
Partition number (1-9): 1

Command (m for help): d
Partition number (1-9): 2

Command (m for help): p

```
Disk /dev/hde: 128 heads, 63 sectors, 777 cylinders
Units = cylinders of 8064 * 512 bytes

   Device Boot     Start        End     Blocks    Id  System
```

```
Command (m for help): o
Building a new DOS disklabel. Changes will remain in memory
only,until you decide to write them. After that, of course,
the previous content won't be recoverable.

Command (m for help): v
6265727 unallocated sectors

Command (m for help): n
Command action
   e    extended
   p    primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-777, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-777, default
777):
Using default value 777

Command (m for help): a
Partition number (1-4): 1

Command (m for help): p

Disk /dev/hde: 128 heads, 63 sectors, 777 cylinders
Units = cylinders of 8064 * 512 bytes

 Device    Boot     Start        End     Blocks   Id  System
/dev/hde1    *         1         777   3132832+   83  Linux

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
  /dev/ide/host2/bus0/target0/lun0: p1
```

WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional
information. Syncing disks.

5.2.5   Make Linux Second Extended Filesystem

root@Yukon:/# mke2fs /dev/hde1

mke2fs 1.27 (8-Mar-2002)

Filesystem label=

OS type: Linux

Block size=4096 (log=2)

Fragment size=4096 (log=2)

391680 inodes, 783208 blocks

39160 blocks (5.00%) reserved for the super user

First data block=0

24 block groups

32768 blocks per group, 32768 fragments per group

16320 inodes per group

Superblock backups stored on blocks:

32768, 98304, 163840, 229376, 294912

Writing inode tables: 0/24 1/24 2/24 3/24 4/24 5/24 6/24 7/24
8/24
9/2410/2411/2412/2413/2414/2415/2416/2417/2418/2419/2420/242
1/2422/2423/24done

Writing superblocks and filesystem accounting information:
done

This filesystem will be automatically checked every 38 mounts
or 180 days, whichever comes first. Use tune2fs -c or -i to
override.

5.2.5.1   Check Filesystem Errors

Any errors or bad blocks detected at this time should be repaired before proceeding. To stem file
corruption, the filesystem should also be checked after any system faults occur.

root@Yukon:/# e2fsck -fc /dev/hde1

5.2.6 Copy Filesystem to Hard Drive

The key to performing this step is the ability to temporarily connect the hard disk drive to the host or use an existing NFS kernel image to facilitate copying the filesystem. In this case, the NFS kernel image which was built in Section 3, "Network File System (Default) was used for demonstration, but directly connecting the drive to the host would work well, and the user must simply mount the drive and copy on the host. The target is assumed to be up and running. Substitute the IP address and remote access directory name for the server's NFS mount point containing the original target filesystem that was installed by MVL in *mvlpath*(/opt/montavista/pro/devkit/ppc/82xx/). This is similar to *myfilesystem* created in Section 3, "Network File System (Default) but is unused, and currently not busy handling the system operations while the NFS version of the kernel is running. If a server mount point which contains the necessary directories is not available, then use the GUI in Fedora to add another NFS mount point before proceeding.

```
root@Yukon:/# mkdir /mnt/hd
root@Yukon:/# mkdir /mnt/nfs
root@Yukon:/# mount /dev/hde1 /mnt/hd
root@Yukon:/# mount ###.###.###.###:/myremotedir /mnt/nfs
root@Yukon:/# cd /mnt/nfs/mvlpath/target/
root@Yukon:/mnt/nfs/mvlpath/target# ls
bin   boot   devetc home libmnt opt procroot sbin tmp usr
var
root@Yukon:/mnt/nfs/mvlpath/target# cp -a * /mnt/hd
root@Yukon:/mnt/nfs/mvlpath/target# ls /mnt/hd
bin   dev   home  lost+found  opt   root  tmp  var
boot  etc  lib mnt      proc  sbin  usr
```

5.2.7 Reboot the Target

Now that the hard disk drive has been prepared with the Linux Second Extended (ext2) filesystem, reboot the target to return to U-Boot so that final preparations can be made. The following output occurs and doesn't require input until U-Boot launches:

```
root@Yukon:/# reboot

Broadcast message from root (console) Thu Jan  1 02:25:44
1970...

The system is going down for reboot NOW !!
root@Yukon:/# INIT: Switching to runlevel: 6
INIT: Sending processes the TERM signal
INIT: Sending processes the KILL signal
Stopping portmap daemon: portmap.
```

```
            Stopping internet superserver: inetd.
            Stopping devfsd: done.
            Stopping kernel log daemon: klogd.
            Stopping system log daemon: syslogd.
            Sending all processes the TERM signal... done.
```

5.2.8   Set U-Boot Bootargs and Boot

```
            => set bootargs root=/dev/hda1 console=ttyS0,115200n8
            => save
            => tftp 100000 mvl5.umg
```

```
Using FEC ETHERNET device
TFTP from server ###.###.###.###; our IP address is ###.###.###.###
Filename 'mvl5.umg'.
Load address: 0x100000
Loading: *##################################################################
           ##################################################################
           ################
done
Bytes transferred = 748770 (b6ce2 hex)
```

```
            => bootm 100000
```

At this point, the Linux kernel will boot up and display a large amount of text. Eventually, it will pause at the login prompt where the root username should be typed, and it will then proceed to the shell prompt of Linux. The first thing most users want to do at this point is to change or set the root password by simply typing the command passwd on its own line. If the system fails to boot, check all of the connections to the board and the storage components. Sometimes, the system may fail to boot because its hard drive didn't have enough time to spin up; try resetting and see if it works on the next boot. Also, check over the environmental variables to make sure they match.

```
## Booting image at fe000000 ...
   Image Name:    Linux-2.4.20_mvl31-8220i
   Image Type:    PowerPC Linux Kernel Image (gzip compressed)
   Data Size:     748706 Bytes = 731.2 kB
   Load Address: 00000000
   Entry Point:  00000000
   Verifying Checksum ... OK
   Uncompressing Kernel Image ... OK
Total memory in system: 256 MB
Memory BAT mapping: BAT2=256Mb, BAT3=0Mb, residual: 0Mb
Linux version 2.4.20_mvl31-8220i (gcc version 3.3.1 (MontaVista 3.3.1-3.0.10.0300532
2003-12-24)) #7 Thu May 12 14:21:28 CDT 2005
Motorola Alaska port by Motorola, Inc.
CPLN rev 5
```

Hard Disk Drive

```
CPLD switches 0x19
Set Pin Mux for FEC1
Set Pin Mux for FEC2
XLB_CONFIG = 00002000
Alaska XLB: Arbiter Master Priority Enable Register = ff
Alaska XLB: Arbiter Master Priority Register = 0
Alaska FPGA PIC: Interrupt Enable Register = 0
Alaska FPGA PIC: Interrupt Status Register = 2f0000
Setup Alaska PCI Controller:
Hose = 0xc0201000, hose->cfg_addr=f0000bf8, hose->cfg_data=effff000
Hose IO Base Physical = 0x81000000
Hose IO Base Virtual = 0x81000000
On node 0 totalpages: 65536
zone(0): 65536 pages.
zone(1): 0 pages.
zone(2): 0 pages.
Kernel command line: root=/dev/hda1 console=ttyS0,115200n8
Using XLB clock (120.00 MHz) to set up decrementer
Calibrating delay loop... 199.88 BogoMIPS
Memory: 257264k available (1252k kernel code, 472k data, 64k init, 0k highmem)
Dentry cache hash table entries: 32768 (order: 6, 262144 bytes)
Inode cache hash table entries: 16384 (order: 5, 131072 bytes)
Mount-cache hash table entries: 4096 (order: 3, 32768 bytes)
Buffer-cache hash table entries: 16384 (order: 4, 65536 bytes)
Page-cache hash table entries: 65536 (order: 6, 262144 bytes)
POSIX conformance testing by UNIFIX
PCI: Probing PCI hardware
Alaska Processor Version Register: 80822013, System Version Register: 80090012
Alaska FPGA Revision: 0x0d
Using 64 DMA buffer descriptors
descUsed f0022000, descriptors f0022008 freeSram f0022800
Using 32 DMA buffer descriptors
descUsed f0022800, descriptors f0022804 freeSram f0022900
Linux NET4.0 for Linux 2.4
Based upon Swansea University Computer Society NET3.039
Initializing RT netlink socket
LSP Revision 111
ikconfig 0.5 with /proc/ikconfig
Starting kswapd
Disabling the Out Of Memory Killer
devfs: v1.12c (20020818) Richard Gooch (rgooch@atnf.csiro.au)
devfs: boot_options: 0x1
JFFS2 version 2.2. (C) 2001-2003 Red Hat, Inc.
pty: 256 Unix98 ptys configured
Uniform Multi-Platform E-IDE driver Revision: 6.31
ide: Assuming 33MHz system bus speed for PIO modes; override with idebus=xx
PDC20268: IDE controller on PCI bus 00 dev a0
PDC20268: chipset revision 2
PDC20268: not 100% native mode: will probe irqs later
PDC20268: ROM enabled at 0x000dc000
    ide0: BM-DMA at 0x81ffffd0-0x81ffffd7, BIOS settings: hda:pio, hdb:pio
    ide1: BM-DMA at 0x81ffffd8-0x81ffffdf, BIOS settings: hdc:pio, hdd:pio
```

```
hda: ST36422A, ATA DISK drive
hdb: FX4820T, ATAPI CD/DVD-ROM drive
ide0 at 0x81fffff8-0x81ffffff,0x81fffff6 on irq 68
blk: queue c01b71a0, I/O limit 4095Mb (mask 0xffffffff)
hda: 12500460 sectors (6400 MB) w/256KiB Cache, CHS=13228/15/63, UDMA(33)
hdb: ATAPI 48X CD-ROM drive, 128kB Cache
Uniform CD-ROM driver Revision: 3.12
Partition check:
 /dev/ide/host0/bus0/target0/lun0: p1
physmap flash device: 1000000 at fe000000
phys_mapped_flash: Found 1 x16 devices at 0x0 in 8-bit bank
 Intel/Sharp Extended Query Table at 0x0031
Using buffer write method
cfi_cmdset_0001: Erase suspend on write enabled
kmod: failed to exec /sbin/modprobe -s -k cmdlinepart, errno = 2
cmdlinepart partition parsing not available
kmod: failed to exec /sbin/modprobe -s -k RedBoot, errno = 2
RedBoot partition parsing not available
Using physmap partition definition
Creating 3 MTD partitions on "phys_mapped_flash":
0x00000000-0x00280000 : "kernel"
0x00280000-0x00ee0000 : "user"
0x00fe0000-0x01000000 : "signature"
MPC8220 FEC initialization
NET4: Linux TCP/IP 1.0 for NET4.0
IP Protocols: ICMP, UDP, TCP, IGMP
IP: routing cache hash table of 2048 buckets, 16Kbytes
TCP: Hash tables configured (established 16384 bind 32768)
NET4: Unix domain sockets 1.0/SMP for Linux NET4.0.
VFS: Mounted root (ext2 filesystem) readonly.
Mounted devfs on /dev
Freeing unused kernel memory: 64k init
INIT: version 2.78 booting
Activating swap...
EXT2-fs warning: mounting unchecked fs, running e2fsck is recommended
Checking all file systems...
fsck 1.27 (8-Mar-2002)
Calculating module dependencies... depmod: *** Unresolved symbols in
/lib/modules/2.4.20_mvl31-8220i/kernel/drivers/ide/ide-probe-mod.o
depmod: *** Unresolved symbols in
/lib/modules/2.4.20_mvl31-8220i/kernel/drivers/input/keybdev.o
done.
Loading modules:
Note: /etc/modules.conf is more recent than
/lib/modules/2.4.20_mvl31-8220i/modules.dep
modprobe: Can't locate module *
Mounting local filesystems...
nothing was mounted
Cleaning: /etc/network/ifstate.
Setting up IP spoofing protection: rp_filter.
Disable TCP/IP Explicit Congestion Notification: done.
Configuring network interfaces: done.
```

```
Starting portmap daemon: portmap.
Cleaning: /tmp /var/lock /var/run.
INIT: Entering runlevel: 3
Starting kernel log daemon: klogd.
Starting system log daemon: syslogd.
Starting devfsd: Started device management daemon for /dev
done.
Starting internet superserver: inetd.

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 (none) login: root
Last login: Thu Jan  1 00:48:46 1970 on console
Linux (none) 2.4.20_mvl31-8220i #7 Thu May 12 14:21:28 CDT 2005 ppc unknown

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root@(none):~# reboot

Broadcast message from root (console) Thu Jan  1 00:16:16 1970...

The system is going down for reboot NOW !!
INIT: Switching to runlevel: 6
INIT: Sending processes the TERM signal
root@(none):~# INIT: Sending processes the KILL signal
Stopping portmap daemon: portmap.
Stopping internet superserver: inetd.
Stopping devfsd: done.
Stopping kernel log daemon: klogd.
Stopping system log daemon: syslogd.
Sending all processes the TERM signal... done.
Sending all processes the KILL signal... done.
Unmounting remote filesystems... done.
Deactivating swap... done.
Unmounting local filesystems... umount2: Device or resource busy
umount: none: not found
umount: /dev: Illegal seek
done.
Rebooting... flushing ide devices: hda hdb
Restarting system.
```

5.3   Configuration Files

```
#
# Automatically generated by make menuconfig: don't edit
#
# CONFIG_UID16 is not set
# CONFIG_RWSEM_GENERIC_SPINLOCK is not set
CONFIG_RWSEM_XCHGADD_ALGORITHM=y
CONFIG_HAVE_DEC_LOCK=y
CONFIG_GENERIC_ISA_DMA=y
```

```
#
# Code maturity level options
#
CONFIG_EXPERIMENTAL=y
CONFIG_ADVANCED_OPTIONS=y


#
# Loadable module support
#
CONFIG_MODULES=y
# CONFIG_MODVERSIONS is not set
CONFIG_KMOD=y


#
# Platform support
#
CONFIG_PPC=y
CONFIG_PPC32=y
CONFIG_6xx=y
# CONFIG_40x is not set
# CONFIG_44x is not set
# CONFIG_E500 is not set
# CONFIG_POWER3 is not set
# CONFIG_8xx is not set
# CONFIG_8260 is not set
# CONFIG_PQII is not set
CONFIG_PPC_STD_MMU=y
# CONFIG_EMBEDDED_OOM_KILLER is not set
# CONFIG_ALL_PPC is not set
# CONFIG_APUS is not set
# CONFIG_WILLOW is not set
# CONFIG_CPCI690 is not set
# CONFIG_PCORE is not set
# CONFIG_POWERPMC250 is not set
# CONFIG_PPMC260 is not set
# CONFIG_EV64260 is not set
# CONFIG_CHESTNUT is not set
# CONFIG_ARGAN is not set
# CONFIG_SPRUCE is not set
# CONFIG_MENF1 is not set
# CONFIG_PUMA_A is not set
CONFIG_ALASKA=y
# CONFIG_ICECUBE is not set
# CONFIG_HXEB100 is not set
# CONFIG_LOPEC is not set
# CONFIG_MCPN765 is not set
# CONFIG_MVME5100 is not set
# CONFIG_PPLUS is not set
# CONFIG_PRPMC750 is not set
# CONFIG_PRPMC800 is not set
# CONFIG_SANDPOINT is not set
# CONFIG_POWERK2 is not set
# CONFIG_ADIR is not set
```

```
# CONFIG_K2 is not set
# CONFIG_PAL4 is not set
# CONFIG_GEMINI is not set
# CONFIG_ZX4500 is not set
CONFIG_MPC8220_PSC_CONSOLE_PORT=0
CONFIG_MPC8220=y
CONFIG_NOT_COHERENT_CACHE=y
# CONFIG_SMP is not set
# CONFIG_PREEMPT is not set
CONFIG_IKCONFIG=y
CONFIG_IKCONFIG_PROC=y
# CONFIG_ALTIVEC is not set
# CONFIG_TAU is not set
CONFIG_PPC_ISATIMER=y


#
# General setup
#
CONFIG_MAX_POSIX_TIMERS=3000
# CONFIG_HIGH_RES_TIMERS is not set
# CONFIG_HIGHMEM is not set
# CONFIG_KERNEL_START_BOOL is not set
# CONFIG_TASK_SIZE_BOOL is not set
# CONFIG_ILATENCY is not set
# CONFIG_ISA is not set
# CONFIG_EISA is not set
# CONFIG_SBUS is not set
# CONFIG_MCA is not set
CONFIG_PCI=y
CONFIG_NET=y
CONFIG_SYSCTL=y
CONFIG_SYSVIPC=y
CONFIG_SYSVIPC_SEMMNI=128
CONFIG_SYSVIPC_SEMMSL=250
# CONFIG_BSD_PROCESS_ACCT is not set
CONFIG_MAX_USER_RT_PRIO=100
CONFIG_MAX_RT_PRIO=0
CONFIG_KCORE_ELF=y
CONFIG_BINFMT_ELF=y
CONFIG_MULTITHREADED_CORES=y
CONFIG_KERNEL_ELF=y
# CONFIG_BINFMT_MISC is not set
# CONFIG_PCI_NAMES is not set
CONFIG_HOTPLUG=y


#
# PCMCIA/CardBus support
#
# CONFIG_PCMCIA is not set
```

```
#
# Parallel port support
#
# CONFIG_PARPORT is not set
# CONFIG_PPC_RTC is not set
# CONFIG_CMDLINE_BOOL is not set


#
# Memory Technology Devices (MTD)
#
CONFIG_MTD=y
# CONFIG_MTD_DEBUG is not set
CONFIG_MTD_PARTITIONS=y
# CONFIG_MTD_CONCAT is not set
# CONFIG_MTD_REDBOOT_PARTS is not set
# CONFIG_MTD_CMDLINE_PARTS is not set
CONFIG_MTD_CHAR=y
CONFIG_MTD_BLOCK=y
# CONFIG_FTL is not set
# CONFIG_NFTL is not set
# CONFIG_INFTL is not set


#
# RAM/ROM/Flash chip drivers
#
CONFIG_MTD_CFI=y
# CONFIG_MTD_JEDECPROBE is not set
CONFIG_MTD_GEN_PROBE=y
CONFIG_MTD_CFI_ADV_OPTIONS=y
CONFIG_MTD_CFI_NOSWAP=y
# CONFIG_MTD_CFI_BE_BYTE_SWAP is not set
# CONFIG_MTD_CFI_LE_BYTE_SWAP is not set
CONFIG_MTD_CFI_GEOMETRY=y
CONFIG_MTD_MAP_BANK_WIDTH_1=y
# CONFIG_MTD_MAP_BANK_WIDTH_2 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_4 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_8 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_16 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_32 is not set
CONFIG_MTD_CFI_I1=y
# CONFIG_MTD_CFI_I2 is not set
# CONFIG_MTD_CFI_I4 is not set
# CONFIG_MTD_CFI_I8 is not set
CONFIG_MTD_CFI_INTELEXT=y
# CONFIG_MTD_CFI_AMDSTD is not set
# CONFIG_MTD_CFI_STAA is not set
CONFIG_MTD_CFI_UTIL=y
# CONFIG_MTD_RAM is not set
CONFIG_MTD_ROM=y
# CONFIG_MTD_ABSENT is not set
# CONFIG_MTD_OBSOLETE_CHIPS is not set
```

```
# CONFIG_MTD_AMDSTD is not set
# CONFIG_MTD_SHARP is not set
# CONFIG_MTD_JEDEC is not set

#
# Mapping drivers for chip access
#
CONFIG_MTD_COMPLEX_MAPPINGS=y
CONFIG_MTD_PHYSMAP=y
CONFIG_MTD_PHYSMAP_START=FE000000
CONFIG_MTD_PHYSMAP_LEN=01000000
CONFIG_MTD_PHYSMAP_BANKWIDTH=2
# CONFIG_MTD_PUMA_A is not set
# CONFIG_MTD_MOT_MVP is not set
# CONFIG_MTD_HXEB100 is not set
# CONFIG_MTD_PPMC260 is not set
# CONFIG_MTD_ARGAN is not set
# CONFIG_MTD_CHESTNUT is not set
# CONFIG_MTD_CPCI690 is not set
# CONFIG_MTD_PCI is not set
# CONFIG_MTD_PCMCIA is not set

#
# Self-contained MTD device drivers
#
# CONFIG_MTD_PMC551 is not set
# CONFIG_MTD_SLRAM is not set
# CONFIG_MTD_MTDRAM is not set
# CONFIG_MTD_BLKMTD is not set
# CONFIG_MTD_DOC2000 is not set
# CONFIG_MTD_DOC2001 is not set
# CONFIG_MTD_DOC2001PLUS is not set
# CONFIG_MTD_DOCPROBE is not set
# CONFIG_MTD_DOCECC is not set
# CONFIG_MTD_SFLASH is not set

#
# NAND Flash Device Drivers
#
# CONFIG_MTD_NAND is not set
# CONFIG_MTD_NAND_NONGENERIC is not set
# CONFIG_MTD_NAND_DISKONCHIP is not set

#
# Plug and Play configuration
#
# CONFIG_PNP is not set
# CONFIG_ISAPNP is not set
```

```
#
# Block devices
#
# CONFIG_BLK_DEV_FD is not set
# CONFIG_BLK_DEV_XD is not set
# CONFIG_PARIDE is not set
# CONFIG_BLK_CPQ_DA is not set
# CONFIG_BLK_CPQ_CISS_DA is not set
# CONFIG_CISS_SCSI_TAPE is not set
# CONFIG_BLK_DEV_DAC960 is not set
# CONFIG_BLK_DEV_UMEM is not set
CONFIG_BLK_DEV_LOOP=m
# CONFIG_BLK_DEV_NBD is not set
# CONFIG_BLK_DEV_RAM is not set
# CONFIG_BLK_DEV_INITRD is not set
# CONFIG_BLK_STATS is not set


#
# Multi-device support (RAID and LVM)
#
# CONFIG_MD is not set
# CONFIG_BLK_DEV_MD is not set
# CONFIG_MD_LINEAR is not set
# CONFIG_MD_RAID0 is not set
# CONFIG_MD_RAID1 is not set
# CONFIG_MD_RAID5 is not set
# CONFIG_MD_MULTIPATH is not set
# CONFIG_BLK_DEV_LVM is not set


#
# Cryptography support (CryptoAPI)
#
# CONFIG_CRYPTO is not set
# CONFIG_CIPHERS is not set
# CONFIG_DIGESTS is not set
# CONFIG_CRYPTODEV is not set


#
# Networking options
#
CONFIG_PACKET=y
# CONFIG_PACKET_MMAP is not set
# CONFIG_NETLINK_DEV is not set
CONFIG_NETFILTER=y
# CONFIG_NETFILTER_DEBUG is not set
# CONFIG_FILTER is not set
# CONFIG_NET_NEIGH_DEBUG is not set
# CONFIG_NET_RESTRICTED_REUSE is not set
CONFIG_UNIX=y
CONFIG_INET=y
# CONFIG_REUSEPORT is not set
# CONFIG_IPSEC is not set
CONFIG_IP_MULTICAST=y
```

Hard Disk Drive

```
# CONFIG_IP_ADVANCED_ROUTER is not set
# CONFIG_IP_PNP is not set
# CONFIG_NET_IPIP is not set
# CONFIG_NET_IPGRE is not set
# CONFIG_IP_MROUTE is not set
# CONFIG_ARPD is not set
# CONFIG_INET_ECN is not set
# CONFIG_SYN_COOKIES is not set
CONFIG_IPV4_IPSEC_TUNNEL=y

#
#   IP: Netfilter Configuration
#
# CONFIG_IP_NF_CONNTRACK is not set
# CONFIG_IP_NF_QUEUE is not set
# CONFIG_IP_NF_IPTABLES is not set
# CONFIG_IP_NF_ARPTABLES is not set
# CONFIG_IP_NF_COMPAT_IPCHAINS is not set
# CONFIG_IP_NF_COMPAT_IPFWADM is not set
CONFIG_IPV6=m
# CONFIG_IPV6_DEBUG is not set
# CONFIG_IPV6_IM is not set
# CONFIG_IPV6_ZONE is not set
# CONFIG_IPV6_DROP_FAKE_V4MAPPED is not set
# CONFIG_IPV6_6TO4_NEXTHOP is not set
# CONFIG_IPV6_PRIVACY is not set
# CONFIG_IPV6_ANYCAST is not set
# CONFIG_IPV6_ISATAP is not set
# CONFIG_IPV6_PREFIXLIST is not set
# CONFIG_IPV6_SUBTREES is not set
# CONFIG_IPV6_ROUTER_PREF is not set
# CONFIG_IPV6_MLD6_ALL_DONE is not set
# CONFIG_IPV6_NODEINFO is not set

#
#   IPv6: Netfilter Configuration
#
# CONFIG_IP6_NF_QUEUE is not set
# CONFIG_IP6_NF_IPTABLES is not set
CONFIG_IPV6_IPSEC_TUNNEL=y
# CONFIG_IPV6_IPV6_TUNNEL is not set
# CONFIG_IPV6_MOBILITY is not set
# CONFIG_KHTTPD is not set
# CONFIG_ATM is not set
# CONFIG_VLAN_8021Q is not set
# CONFIG_IPX is not set
# CONFIG_ATALK is not set
```

```
#
# Appletalk devices
#
# CONFIG_DEV_APPLETALK is not set
# CONFIG_DECNET is not set
# CONFIG_BRIDGE is not set
# CONFIG_X25 is not set
# CONFIG_LAPB is not set
# CONFIG_LLC is not set
# CONFIG_NET_DIVERT is not set
# CONFIG_ECONET is not set
# CONFIG_WAN_ROUTER is not set
# CONFIG_NET_FASTROUTE is not set
# CONFIG_NET_HW_FLOWCONTROL is not set


#
# QoS and/or fair queueing
#
# CONFIG_NET_SCHED is not set


#
# Network testing
#
# CONFIG_NET_PKTGEN is not set


#
# ATA/IDE/MFM/RLL support
#
CONFIG_IDE=y


#
# IDE, ATA and ATAPI Block devices
#
CONFIG_BLK_DEV_IDE=y
# CONFIG_BLK_DEV_HD_IDE is not set
# CONFIG_BLK_DEV_HD is not set
CONFIG_BLK_DEV_IDEDISK=y
# CONFIG_IDEDISK_MULTI_MODE is not set
# CONFIG_IDEDISK_STROKE is not set
# CONFIG_BLK_DEV_IDEDISK_VENDOR is not set
# CONFIG_BLK_DEV_IDEDISK_FUJITSU is not set
# CONFIG_BLK_DEV_IDEDISK_IBM is not set
# CONFIG_BLK_DEV_IDEDISK_MAXTOR is not set
# CONFIG_BLK_DEV_IDEDISK_QUANTUM is not set
# CONFIG_BLK_DEV_IDEDISK_SEAGATE is not set
# CONFIG_BLK_DEV_IDEDISK_WD is not set
# CONFIG_BLK_DEV_COMMERIAL is not set
# CONFIG_BLK_DEV_TIVO is not set
# CONFIG_BLK_DEV_IDECS is not set
CONFIG_BLK_DEV_IDECD=y
# CONFIG_BLK_DEV_IDETAPE is not set
# CONFIG_BLK_DEV_IDEFLOPPY is not set
# CONFIG_BLK_DEV_IDESCSI is not set
```

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Hard Disk Drive

```
# CONFIG_IDE_TASK_IOCTL is not set
# CONFIG_BLK_DEV_CMD640 is not set
# CONFIG_BLK_DEV_CMD640_ENHANCED is not set
# CONFIG_BLK_DEV_ISAPNP is not set
# CONFIG_BLK_DEV_RZ1000 is not set
CONFIG_BLK_DEV_IDEPCI=y
# CONFIG_IDEPCI_SHARE_IRQ is not set
CONFIG_BLK_DEV_IDEDMA_PCI=y
CONFIG_BLK_DEV_OFFBOARD=y
# CONFIG_BLK_DEV_IDEDMA_FORCED is not set
CONFIG_IDEDMA_PCI_AUTO=y
# CONFIG_IDEDMA_ONLYDISK is not set
CONFIG_BLK_DEV_IDEDMA=y
# CONFIG_IDEDMA_PCI_WIP is not set
# CONFIG_BLK_DEV_IDEDMA_TIMEOUT is not set
# CONFIG_IDEDMA_NEW_DRIVE_LISTINGS is not set
CONFIG_BLK_DEV_ADMA=y
# CONFIG_BLK_DEV_AEC62XX is not set
# CONFIG_AEC62XX_TUNING is not set
# CONFIG_BLK_DEV_ALI15X3 is not set
# CONFIG_WDC_ALI15X3 is not set
# CONFIG_BLK_DEV_AMD74XX is not set
# CONFIG_AMD74XX_OVERRIDE is not set
# CONFIG_BLK_DEV_CMD64X is not set
# CONFIG_BLK_DEV_SII_680 is not set
# CONFIG_BLK_DEV_CY82C693 is not set
# CONFIG_BLK_DEV_CS5530 is not set
# CONFIG_BLK_DEV_CS5535 is not set
# CONFIG_BLK_DEV_HPT34X is not set
# CONFIG_HPT34X_AUTODMA is not set
# CONFIG_BLK_DEV_HPT366 is not set
# CONFIG_BLK_DEV_HPT371 is not set
# CONFIG_BLK_DEV_NS87415 is not set
# CONFIG_BLK_DEV_OPTI621 is not set
CONFIG_BLK_DEV_PDC202XX=y
CONFIG_PDC202XX_BURST=y
# CONFIG_PDC202XX_FORCE is not set
# CONFIG_BLK_DEV_SVWKS is not set
# CONFIG_BLK_DEV_SIS5513 is not set
# CONFIG_BLK_DEV_SLC90E66 is not set
# CONFIG_BLK_DEV_TRM290 is not set
# CONFIG_BLK_DEV_VIA82CXXX is not set
# CONFIG_BLK_DEV_SL82C105 is not set
# CONFIG_BLK_DEV_XILLEON is not set
# CONFIG_BLK_DEV_TC86C001 is not set
# CONFIG_IDE_CHIPSETS is not set
CONFIG_IDEDMA_AUTO=y
# CONFIG_IDEDMA_IVB is not set
# CONFIG_DMA_NONPCI is not set
CONFIG_BLK_DEV_IDE_MODES=y
# CONFIG_BLK_DEV_ATARAID is not set
# CONFIG_BLK_DEV_ATARAID_PDC is not set
# CONFIG_BLK_DEV_ATARAID_HPT is not set
```

```
#
# SCSI support
#
CONFIG_SCSI=m
CONFIG_BLK_DEV_SD=m
CONFIG_SD_EXTRA_DEVS=40
# CONFIG_CHR_DEV_ST is not set
# CONFIG_CHR_DEV_OSST is not set
# CONFIG_BLK_DEV_SR is not set
CONFIG_CHR_DEV_SG=m
# CONFIG_SCSI_DEBUG_QUEUES is not set
# CONFIG_SCSI_MULTI_LUN is not set
# CONFIG_SCSI_CONSTANTS is not set
# CONFIG_SCSI_LOGGING is not set


#
# SCSI low-level drivers
#
# CONFIG_BLK_DEV_3W_XXXX_RAID is not set
# CONFIG_SCSI_7000FASST is not set
# CONFIG_SCSI_ACARD is not set
# CONFIG_SCSI_AHA152X is not set
# CONFIG_SCSI_AHA1542 is not set
# CONFIG_SCSI_AHA1740 is not set
# CONFIG_SCSI_AACRAID is not set
# CONFIG_SCSI_AIC7XXX is not set
# CONFIG_SCSI_AIC79XX is not set
# CONFIG_SCSI_AIC7XXX_OLD is not set
# CONFIG_SCSI_DPT_I2O is not set
# CONFIG_SCSI_ADVANSYS is not set
# CONFIG_SCSI_IN2000 is not set
# CONFIG_SCSI_AM53C974 is not set
# CONFIG_SCSI_MEGARAID is not set
# CONFIG_SCSI_BUSLOGIC is not set
# CONFIG_SCSI_CPQFCTS is not set
# CONFIG_SCSI_DMX3191D is not set
# CONFIG_SCSI_DTC3280 is not set
# CONFIG_SCSI_EATA is not set
# CONFIG_SCSI_EATA_DMA is not set
# CONFIG_SCSI_EATA_PIO is not set
# CONFIG_SCSI_FUTURE_DOMAIN is not set
# CONFIG_SCSI_GDTH is not set
# CONFIG_SCSI_GENERIC_NCR5380 is not set
# CONFIG_SCSI_INITIO is not set
# CONFIG_SCSI_INIA100 is not set
# CONFIG_SCSI_NCR53C406A is not set
# CONFIG_SCSI_NCR53C7xx is not set
# CONFIG_SCSI_SYM53C8XX_2 is not set
# CONFIG_SCSI_NCR53C8XX is not set
# CONFIG_SCSI_SYM53C8XX is not set
# CONFIG_SCSI_PAS16 is not set
# CONFIG_SCSI_PCI2000 is not set
```

```
# CONFIG_SCSI_PCI2220I is not set
# CONFIG_SCSI_PSI240I is not set
# CONFIG_SCSI_QLOGIC_FAS is not set
# CONFIG_SCSI_QLOGIC_ISP is not set
# CONFIG_SCSI_QLOGIC_FC is not set
# CONFIG_SCSI_QLOGIC_1280 is not set
# CONFIG_SCSI_QLOGIC_23XX is not set
# CONFIG_SCSI_SIM710 is not set
# CONFIG_SCSI_SYM53C416 is not set
# CONFIG_SCSI_DC390T is not set
# CONFIG_SCSI_T128 is not set
# CONFIG_SCSI_U14_34F is not set
# CONFIG_SCSI_DEBUG is not set


#
# Fusion MPT device support
#
# CONFIG_FUSION is not set
# CONFIG_FUSION_BOOT is not set
# CONFIG_FUSION_ISENSE is not set
# CONFIG_FUSION_CTL is not set
# CONFIG_FUSION_LAN is not set


#
# IEEE 1394 (FireWire) support (EXPERIMENTAL)
#
# CONFIG_IEEE1394 is not set


#
# I2O device support
#
# CONFIG_I2O is not set
# CONFIG_I2O_PCI is not set
# CONFIG_I2O_BLOCK is not set
# CONFIG_I2O_LAN is not set
# CONFIG_I2O_SCSI is not set
# CONFIG_I2O_PROC is not set


#
# Network device support
#
CONFIG_NETDEVICES=y


#
# Broadcom network devices
#
# CONFIG_HND is not set


#
# ARCnet devices
#
# CONFIG_ARCNET is not set
# CONFIG_DUMMY is not set
```

```
# CONFIG_BONDING is not set
# CONFIG_EQUALIZER is not set
# CONFIG_IMQ is not set
CONFIG_TUN=m
# CONFIG_ETHERTAP is not set


#
# Ethernet (10 or 100Mbit)
#
CONFIG_NET_ETHERNET=y
# CONFIG_MACE is not set
# CONFIG_BMAC is not set
# CONFIG_GMAC is not set
# CONFIG_SUNLANCE is not set
# CONFIG_HAPPYMEAL is not set
# CONFIG_SUNBMAC is not set
# CONFIG_SUNQE is not set
# CONFIG_SUNGEM is not set
# CONFIG_NET_VENDOR_3COM is not set
# CONFIG_LANCE is not set
# CONFIG_NET_VENDOR_SMC is not set
# CONFIG_NET_VENDOR_RACAL is not set
# CONFIG_HP100 is not set
# CONFIG_NET_ISA is not set
CONFIG_NET_PCI=y
# CONFIG_PCNET32 is not set
# CONFIG_ADAPTEC_STARFIRE is not set
# CONFIG_APRICOT is not set
CONFIG_TULIP=m
# CONFIG_TULIP_MWI is not set
# CONFIG_TULIP_MMIO is not set
# CONFIG_DE4X5 is not set
# CONFIG_DGRS is not set
# CONFIG_DM9102 is not set
# CONFIG_EEPRO100 is not set
# CONFIG_E100 is not set
# CONFIG_E100_DIAG is not set
# CONFIG_LNE390 is not set
# CONFIG_FEALNX is not set
CONFIG_NATSEMI=m
# CONFIG_NE2K_PCI is not set
# CONFIG_NE3210 is not set
# CONFIG_ES3210 is not set
# CONFIG_8139CP is not set
# CONFIG_8139TOO is not set
# CONFIG_8139TOO_PIO is not set
# CONFIG_8139TOO_TUNE_TWISTER is not set
# CONFIG_8139TOO_8129 is not set
# CONFIG_8139_OLD_RX_RESET is not set
# CONFIG_SIS900 is not set
# CONFIG_EPIC100 is not set
# CONFIG_SUNDANCE is not set
# CONFIG_SUNDANCE_MMIO is not set
```

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```
# CONFIG_TLAN is not set
# CONFIG_TC35815 is not set
# CONFIG_VIA_RHINE is not set
# CONFIG_VIA_RHINE_MMIO is not set
# CONFIG_WINBOND_840 is not set
# CONFIG_CS89x0 is not set
# CONFIG_NET_POCKET is not set
# CONFIG_MVNET is not set

#
# Ethernet (1000 Mbit)
#
# CONFIG_ACENIC is not set
# CONFIG_DL2K is not set
# CONFIG_E1000 is not set
# CONFIG_E1000_DIAG is not set
# CONFIG_MYRI_SBUS is not set
# CONFIG_NS83820 is not set
# CONFIG_HAMACHI is not set
# CONFIG_YELLOWFIN is not set
# CONFIG_SK98LIN is not set
# CONFIG_NET_BROADCOM is not set
# CONFIG_TIGON3 is not set
# CONFIG_GIANFAR is not set
# CONFIG_GFAR_NAPI is not set
# CONFIG_GFAR_BDSTASH is not set
# CONFIG_GFAR_BUFSTASH is not set
# CONFIG_FDDI is not set
# CONFIG_HIPPI is not set
# CONFIG_PLIP is not set
CONFIG_PPP=m
# CONFIG_PPP_MULTILINK is not set
# CONFIG_PPP_FILTER is not set
CONFIG_PPP_ASYNC=m
CONFIG_PPP_SYNC_TTY=m
CONFIG_PPP_DEFLATE=m
# CONFIG_PPP_BSDCOMP is not set
# CONFIG_PPPOE is not set
# CONFIG_SLIP is not set

#
# Wireless LAN (non-hamradio)
#
# CONFIG_NET_RADIO is not set

#
# Token Ring devices
#
# CONFIG_TR is not set
# CONFIG_NET_FC is not set
# CONFIG_RCPCI is not set
# CONFIG_SHAPER is not set
```

```
#
# Wan interfaces
#
# CONFIG_WAN is not set

#
# Amateur Radio support
#
# CONFIG_HAMRADIO is not set

#
# IrDA (infrared) support
#
# CONFIG_IRDA is not set

#
# ISDN subsystem
#
# CONFIG_ISDN is not set

#
# Old CD-ROM drivers (not SCSI, not IDE)
#
# CONFIG_CD_NO_IDESCSI is not set

#
# Console drivers
#
# CONFIG_VGA_CONSOLE is not set

#
# Frame-buffer support
#
# CONFIG_FB is not set

#
# Input core support
#
CONFIG_INPUT=m
CONFIG_INPUT_KEYBDEV=m
CONFIG_INPUT_MOUSEDEV=m
CONFIG_INPUT_MOUSEDEV_SCREEN_X=1024
CONFIG_INPUT_MOUSEDEV_SCREEN_Y=768
# CONFIG_INPUT_JOYDEV is not set
CONFIG_INPUT_EVDEV=m

#
# Macintosh device drivers
#
```

```
#
# Character devices
#
# CONFIG_VT is not set
# CONFIG_SERIAL is not set
# CONFIG_SERIAL_EXTENDED is not set
# CONFIG_SERIAL_NONSTANDARD is not set

#
# Serial drivers
#
# CONFIG_SERIAL_8250 is not set
# CONFIG_SERIAL_8250_CONSOLE is not set
# CONFIG_SERIAL_8250_EXTENDED is not set
# CONFIG_SERIAL_8250_MANY_PORTS is not set
# CONFIG_SERIAL_8250_SHARE_IRQ is not set
# CONFIG_SERIAL_8250_DETECT_IRQ is not set
# CONFIG_SERIAL_8250_MULTIPORT is not set
# CONFIG_SERIAL_8250_HUB6 is not set
CONFIG_UNIX98_PTYS=y
CONFIG_UNIX98_PTY_COUNT=256
# CONFIG_IXP2000_SLAVE is not set

#
# I2C support
#
# CONFIG_I2C is not set

#
# Mice
#
# CONFIG_BUSMOUSE is not set
# CONFIG_MOUSE is not set

#
# Joysticks
#
# CONFIG_INPUT_GAMEPORT is not set
# CONFIG_INPUT_NS558 is not set
# CONFIG_INPUT_LIGHTNING is not set
# CONFIG_INPUT_PCIGAME is not set
# CONFIG_INPUT_CS461X is not set
# CONFIG_INPUT_EMU10K1 is not set
# CONFIG_INPUT_SERIO is not set
# CONFIG_INPUT_SERPORT is not set
# CONFIG_INPUT_ANALOG is not set
# CONFIG_INPUT_A3D is not set
# CONFIG_INPUT_ADI is not set
# CONFIG_INPUT_COBRA is not set
# CONFIG_INPUT_GF2K is not set
# CONFIG_INPUT_GRIP is not set
# CONFIG_INPUT_INTERACT is not set
```

```
# CONFIG_INPUT_TMDC is not set
# CONFIG_INPUT_SIDEWINDER is not set
# CONFIG_INPUT_IFORCE_USB is not set
# CONFIG_INPUT_IFORCE_232 is not set
# CONFIG_INPUT_WARRIOR is not set
# CONFIG_INPUT_MAGELLAN is not set
# CONFIG_INPUT_SPACEORB is not set
# CONFIG_INPUT_SPACEBALL is not set
# CONFIG_INPUT_STINGER is not set
# CONFIG_INPUT_DB9 is not set
# CONFIG_INPUT_GAMECON is not set
# CONFIG_INPUT_TURBOGRAFX is not set
# CONFIG_QIC02_TAPE is not set


#
# Watchdog Cards
#
# CONFIG_WATCHDOG is not set
# CONFIG_LINUX_LED is not set
# CONFIG_CPCI735_LED is not set
# CONFIG_AMD_PM768 is not set
# CONFIG_NVRAM is not set
# CONFIG_RTC is not set
# CONFIG_DTLK is not set
# CONFIG_R3964 is not set
# CONFIG_APPLICOM is not set


#
# Ftape, the floppy tape device driver
#
# CONFIG_FTAPE is not set
# CONFIG_AGP is not set
# CONFIG_DRM is not set
# CONFIG_DEVSOC is not set


#
# Multimedia devices
#
# CONFIG_VIDEO_DEV is not set


#
# File systems
#
# CONFIG_QUOTA is not set
# CONFIG_QFMT_V1 is not set
# CONFIG_QFMT_V2 is not set
# CONFIG_QIFACE_COMPAT is not set
# CONFIG_AUTOFS_FS is not set
CONFIG_AUTOFS4_FS=y
CONFIG_REISERFS_FS=m
# CONFIG_REISERFS_CHECK is not set
# CONFIG_REISERFS_PROC_INFO is not set
# CONFIG_ADFS_FS is not set
```

```
# CONFIG_ADFS_FS_RW is not set
# CONFIG_AFFS_FS is not set
# CONFIG_HFS_FS is not set
# CONFIG_BEFS_FS is not set
# CONFIG_BEFS_DEBUG is not set
# CONFIG_BFS_FS is not set
CONFIG_EXT3_FS=m
CONFIG_JBD=m
# CONFIG_JBD_DEBUG is not set
CONFIG_FAT_FS=m
CONFIG_MSDOS_FS=m
CONFIG_UMSDOS_FS=m
CONFIG_VFAT_FS=m
# CONFIG_EFS_FS is not set
# CONFIG_JFFS_FS is not set
CONFIG_JFFS2_FS=y
CONFIG_JFFS2_FS_DEBUG=0
# CONFIG_JFFS2_FS_NAND is not set
# CONFIG_JFFS2_ZLIB is not set
# CONFIG_JFFS2_RTIME is not set
# CONFIG_JFFS2_RUBIN is not set
# CONFIG_JFFS2_LZO is not set
# CONFIG_JFFS2_LZARI is not set
# CONFIG_JFFS2_CMODE_NONE is not set
CONFIG_JFFS2_CMODE_PRIORITY=y
# CONFIG_JFFS2_CMODE_SIZE is not set
# CONFIG_JFFS2_PROC is not set
CONFIG_CRAMFS=y
# CONFIG_POSIX_MQUEUE_FS is not set
CONFIG_TMPFS=y
CONFIG_RAMFS=y
CONFIG_ISO9660_FS=m
CONFIG_JOLIET=y
# CONFIG_ZISOFS is not set
# CONFIG_JFS_FS is not set
# CONFIG_JFS_DEBUG is not set
# CONFIG_JFS_STATISTICS is not set
# CONFIG_MINIX_FS is not set
# CONFIG_VXFS_FS is not set
# CONFIG_NTFS_FS is not set
# CONFIG_NTFS_RW is not set
# CONFIG_HPFS_FS is not set
CONFIG_PROC_FS=y
CONFIG_DEVFS_FS=y
CONFIG_DEVFS_MOUNT=y
# CONFIG_DEVFS_DEBUG is not set
CONFIG_DEVPTS_FS=y
# CONFIG_QNX4FS_FS is not set
# CONFIG_QNX4FS_RW is not set
CONFIG_ROMFS_FS=y
CONFIG_EXT2_FS=y
# CONFIG_SYSV_FS is not set
CONFIG_UDF_FS=m
```

```
# CONFIG_UDF_RW is not set
CONFIG_UFS_FS=m
# CONFIG_UFS_FS_WRITE is not set
CONFIG_XFS_FS=m
# CONFIG_XFS_POSIX_ACL is not set
# CONFIG_XFS_RT is not set
# CONFIG_XFS_QUOTA is not set
# CONFIG_XFS_DMAPI is not set
# CONFIG_XFS_DEBUG is not set
# CONFIG_PAGEBUF_DEBUG is not set


#
# Network File Systems
#
# CONFIG_CODA_FS is not set
# CONFIG_INTERMEZZO_FS is not set
CONFIG_NFS_FS=y
CONFIG_NFS_V3=y
# CONFIG_ROOT_NFS is not set
CONFIG_NFSD=m
CONFIG_NFSD_V3=y
# CONFIG_NFSD_TCP is not set
CONFIG_SUNRPC=y
CONFIG_LOCKD=y
CONFIG_LOCKD_V4=y
CONFIG_SMB_FS=m
# CONFIG_SMB_NLS_DEFAULT is not set
# CONFIG_NCP_FS is not set
# CONFIG_NCPFS_PACKET_SIGNING is not set
# CONFIG_NCPFS_IOCTL_LOCKING is not set
# CONFIG_NCPFS_STRONG is not set
# CONFIG_NCPFS_NFS_NS is not set
# CONFIG_NCPFS_OS2_NS is not set
# CONFIG_NCPFS_SMALLDOS is not set
# CONFIG_NCPFS_NLS is not set
# CONFIG_NCPFS_EXTRAS is not set
# CONFIG_ZISOFS_FS is not set


#
# Partition Types
#
# CONFIG_PARTITION_ADVANCED is not set
CONFIG_MSDOS_PARTITION=y
CONFIG_SMB_NLS=y
CONFIG_NLS=y


#
# Native Language Support
#
CONFIG_NLS_DEFAULT="iso8859-1"
# CONFIG_NLS_CODEPAGE_437 is not set
# CONFIG_NLS_CODEPAGE_737 is not set
# CONFIG_NLS_CODEPAGE_775 is not set
```

```
# CONFIG_NLS_CODEPAGE_850 is not set
# CONFIG_NLS_CODEPAGE_852 is not set
# CONFIG_NLS_CODEPAGE_855 is not set
# CONFIG_NLS_CODEPAGE_857 is not set
# CONFIG_NLS_CODEPAGE_860 is not set
# CONFIG_NLS_CODEPAGE_861 is not set
# CONFIG_NLS_CODEPAGE_862 is not set
# CONFIG_NLS_CODEPAGE_863 is not set
# CONFIG_NLS_CODEPAGE_864 is not set
# CONFIG_NLS_CODEPAGE_865 is not set
# CONFIG_NLS_CODEPAGE_866 is not set
# CONFIG_NLS_CODEPAGE_869 is not set
# CONFIG_NLS_CODEPAGE_936 is not set
# CONFIG_NLS_CODEPAGE_950 is not set
# CONFIG_NLS_CODEPAGE_932 is not set
# CONFIG_NLS_CODEPAGE_949 is not set
# CONFIG_NLS_CODEPAGE_874 is not set
# CONFIG_NLS_ISO8859_8 is not set
# CONFIG_NLS_CODEPAGE_1250 is not set
# CONFIG_NLS_CODEPAGE_1251 is not set
# CONFIG_NLS_ISO8859_1 is not set
# CONFIG_NLS_ISO8859_2 is not set
# CONFIG_NLS_ISO8859_3 is not set
# CONFIG_NLS_ISO8859_4 is not set
# CONFIG_NLS_ISO8859_5 is not set
# CONFIG_NLS_ISO8859_6 is not set
# CONFIG_NLS_ISO8859_7 is not set
# CONFIG_NLS_ISO8859_9 is not set
# CONFIG_NLS_ISO8859_13 is not set
# CONFIG_NLS_ISO8859_14 is not set
# CONFIG_NLS_ISO8859_15 is not set
# CONFIG_NLS_KOI8_R is not set
# CONFIG_NLS_KOI8_U is not set
# CONFIG_NLS_UTF8 is not set

#
# Sound
#
# CONFIG_SOUND is not set

#
# MPC8220 I/O Options
#
CONFIG_PPC_8220_PSC=y
CONFIG_PPC_8220_PSC_CONSOLE=y
CONFIG_SERIAL_CONSOLE=y
CONFIG_BESTDMA=y
CONFIG_ALASKA_FEC=y
CONFIG_ALASKA_1284=m
CONFIG_ALASKA_1284_DMA=y
```

```
#
# USB support
#
CONFIG_USB=m
# CONFIG_USB_DEBUG is not set
CONFIG_USB_DEVICEFS=y
# CONFIG_USB_BANDWIDTH is not set
CONFIG_USB_LONG_TIMEOUT=y
# CONFIG_USB_EHCI_HCD is not set
# CONFIG_USB_MX2_OTG is not set
# CONFIG_USB_MX2_HCD is not set
# CONFIG_USB_UHCI is not set
# CONFIG_USB_UHCI_ALT is not set
CONFIG_USB_OHCI=m
# CONFIG_USB_NON_PCI_OHCI is not set
CONFIG_USB_OHCI_MPC8220I=m
# CONFIG_USB_AUDIO is not set
# CONFIG_USB_EMI26 is not set
# CONFIG_USB_BLUETOOTH is not set
# CONFIG_USB_MIDI is not set
CONFIG_USB_STORAGE=m
CONFIG_USB_STORAGE_DEBUG=y
CONFIG_USB_STORAGE_DATAFAB=y
# CONFIG_USB_STORAGE_FREECOM is not set
CONFIG_USB_STORAGE_ISD200=y
CONFIG_USB_STORAGE_DPCM=y
# CONFIG_USB_STORAGE_HP8200e is not set
CONFIG_USB_STORAGE_SDDR09=y
CONFIG_USB_STORAGE_SDDR55=y
CONFIG_USB_STORAGE_JUMPSHOT=y
# CONFIG_USB_ACM is not set
CONFIG_USB_PRINTER=m
CONFIG_USB_HID=m
CONFIG_USB_HIDINPUT=y
# CONFIG_USB_HIDDEV is not set
# CONFIG_USB_KBD is not set
# CONFIG_USB_MOUSE is not set
# CONFIG_USB_AIPTEK is not set
# CONFIG_USB_WACOM is not set
# CONFIG_USB_DC2XX is not set
# CONFIG_USB_MDC800 is not set
# CONFIG_USB_SCANNER is not set
# CONFIG_USB_MICROTEK is not set
# CONFIG_USB_HPUSBSCSI is not set
# CONFIG_USB_PEGASUS is not set
# CONFIG_USB_RTL8150 is not set
# CONFIG_USB_KAWETH is not set
# CONFIG_USB_CATC is not set
# CONFIG_USB_CDCETHER is not set
# CONFIG_USB_USBNET is not set
# CONFIG_USB_USS720 is not set
```

```
#
# USB Serial Converter support
#
# CONFIG_USB_SERIAL is not set
# CONFIG_USB_RIO500 is not set
# CONFIG_USB_AUERSWALD is not set
# CONFIG_USB_TIGL is not set
# CONFIG_USB_BRLVGER is not set
# CONFIG_USB_LCD is not set

#
# USB Device Support
#
CONFIG_USBD=m
CONFIG_USBD_VENDORID=0000
CONFIG_USBD_PRODUCTID=0000
CONFIG_USBD_PRODUCT_NAME="Yukon"
CONFIG_USBD_MANUFACTURER="Freescale"
# CONFIG_USBD_USE_SERIAL_NUMBER is not set
# CONFIG_USBD_SELFPOWERED is not set
CONFIG_USBD_MAXPOWER=0
# CONFIG_USBD_EP0_SUPPORT is not set
# CONFIG_USBD_MONITOR is not set
# CONFIG_USBD_PROCFS is not set
CONFIG_ALASKA_USB=m
CONFIG_ALASKA_USB_DMA=y
# CONFIG_USBD_M8xx_TTY is not set
# CONFIG_USBD_PQ2_TTY is not set

#
# Network Function
#
# CONFIG_USBD_NET is not set

#
# Serial Function
#
# CONFIG_USBD_SERIAL is not set

#
# Mouse Function
#
# CONFIG_USBD_MOUSE is not set

#
# Mass Storage Function
#
# CONFIG_USBD_STORAGE is not set

#
# EP0 test Function
#
# CONFIG_USBD_TEST is not set
```

```
#
# USB Device Bus Interface Support
#
# CONFIG_USBD_GENERIC_BUS is not set

#
# Bluetooth support
#
# CONFIG_BLUEZ is not set

#
# Kernel tracing
#
# CONFIG_TRACE is not set
# CONFIG_TRACE_BOOT is not set

#
# Library routines
#
CONFIG_ZLIB_INFLATE=y
CONFIG_ZLIB_DEFLATE=m

#
# Kernel hacking
#
# CONFIG_DEBUG_KERNEL is not set
# CONFIG_SERIAL_TEXT_DEBUG is not set
```

6   Conclusion

In summary, this guide shows how to install and build MontaVista Linux Professional Edition 3.1 for the MPC8220(i) platform. This document briefly explains what some of the most important components are and how they are used in the process, from installation of MVL tools, to configuration of Linux environments, to building the system for the target, to loading and launching the platform. It demonstrates how the different types of filesystems can be created and used in a few steps, then deployed to the target. This application note allows the reader to gain a better understanding of the Linux OS concepts and the ability to smoothly deploy his own systems in the future. For more information on MontaVista Linux, please refer to their manual, search their MVZone site, or consult their customer support representatives. For more information on Freescale and the MPC8220(i), please contact a Freescale representative and check the Compass site frequently.

7   Resources & References

Das U-Boot project home page

http://sourceforge.net/projects/u-boot/

DENX U-Boot and Linux Guide

http://www.denx.de/twiki/bin/view/DULG/Manual

Introduction to Das U-Boot, the universal open source bootloader by Curt Brune (8/31/2004)

http://linuxdevices.com/articles/AT5085702347.html

Linux on *Wikipedia, The Free Encyclopedia*

http://en.wikipedia.org/wiki/Linux

MontaVista Software and Support (aka Zone)

http://mvista.com

http://support.mvista.com (requires registration)

MPC8220(i) documentation on Freescale Compass Site (requires registration)

https://www.freescale.com/cgi/go/147091658

https://www.freescale.com/cgi/doc/147100051/Final_Preliminary_Users_Manual_Revision_1.pdf

8   Revision History

Table 1. Revision History

Revision #	Date	Reason
0	05/2006	Initial public release

How to Reach Us:

Home Page:
www.freescale.com

E-mail:
support@freescale.com

USA/Europe or Locations Not Listed:
Freescale Semiconductor
Technical Information Center, CH370
1300 N. Alma School Road
Chandler, Arizona 85224
+1-800-521-6274 or +1-480-768-2130
support@freescale.com

Europe, Middle East, and Africa:
Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
support@freescale.com

Japan:
Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064
Japan
0120 191014 or +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:
Freescale Semiconductor Hong Kong Ltd.
Technical Information Center
2 Dai King Street
Tai Po Industrial Estate
Tai Po, N.T., Hong Kong
+800 2666 8080
support.asia@freescale.com

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
P.O. Box 5405
Denver, Colorado 80217
1-800-441-2447 or 303-675-2140
Fax: 303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

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