

THE LEARNING LABS, INC.

# Building BusyBox for the TLL6219 ARM Processor

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**7/31/2008**

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## Introduction

This document describes how to build the 1.10.3 version of BusyBox middleware executable for the TLL6219 ARM processor. NOTE: This compilation procedure is intended to run on X86 based Linux machines because BusyBox cannot be compiled on Windows based machines due to makefile issues.

## What is BusyBox

BusyBox combines tiny versions of many common UNIX utilities into a single small executable. It provides minimalist replacements for most of the utilities you usually find in bzip2, coreutils, dhcp, diffutils, e2fsprogs, file, findutils, gawk, grep, inetutils, less, modutils, net-tools, procs, sed, shadow, syslogd, sysvinit, tar, util-linux, and vim. The utilities in BusyBox often have fewer options than their full-featured cousins; however, the options that are included provide the expected functionality and behave very much like their larger counterparts.

BusyBox has been written with size-optimization and limited resources in mind, both to produce small binaries and to reduce run-time memory usage. Busybox is also extremely modular so you can easily include or exclude commands (or features) at compile time. This makes it easy to customize embedded systems; to create a working system, just add /dev, /etc, and a Linux kernel.

## Downloading the source code

Source for the latest released version, as well as daily snapshots, can always be downloaded from

<http://busybox.net/downloads/>

You can browse the up to the minute source code and change history online.

<http://www.busybox.net/cgi-bin/viewcvs.cgi/trunk/busybox/>

Anonymous SVN access is available. For instructions, check out:

<http://busybox.net/subversion.html>

For those that are actively contributing and would like to check files in, see:

<http://busybox.net/developer.html>

The developers also have a bug and patch tracking system (<http://bugs.busybox.net>) although posting a bug/patch to the mailing list is generally a faster way of getting it fixed, and the complete archive of what happened is the subversion *changelog*.

Note: if you want to compile busybox in a busybox environment you must select `ENABLE_DESKTOP`

## Software Requirements

For the TLL6219 we will be using the CodeSourcery 4.3.2 version of gcc as this is the only Linux based version that will compile BusyBox. Refer to the CodeSourcery Installation manual for details.

## Configuring BusyBox

Busybox is optimized for size, but enabling the full set of functionality still results in a fairly large executable -- more than 1 megabyte when statically linked. To save space, busybox can be configured with only the set of applets needed for each environment. The minimal configuration, with all applets disabled, produces a 4k executable. (It's useless, but very small.)

The manual configurator "*make menuconfig*" modifies the existing configuration. The two most interesting starting configurations are "make allnoconfig" (to start with everything disabled and add just what you need), and "make defconfig" (to start with everything enabled and remove what you don't need). If menuconfig is run without an existing configuration, "*make defconfig*" will run first to create a known starting point.

Other starting configurations (mostly used for testing purposes) include "make allbareconfig" (enables all applets but disables all optional features), "make allyesconfig" (enables absolutely everything including debug features), and "make randconfig" (produce a random configuration).

Configuring BusyBox produces a file ".config", which can be saved for future use. Run "make oldconfig" to bring a .config file from an older version of busybox up to date.

## Compiling BusyBox

The BusyBox build process is similar to the Linux kernel build:

```
make menuconfig  # This creates a file called ".config"  
make             # This creates the "busybox" executable
```

The full list of configuration and install options is available by typing:

```
make help
```

## Installing BusyBox

To build the directory structure

```
make install           # or make CONFIG_PREFIX=/path/from/root install
```

## .config File

BusyBox on the TLL6219 is configured using *make defconfig* which results in the default .config file.

```
#
# Automatically generated make config: don't edit
# Busybox version: 1.10.3
# Thu Jul 10 14:53:19 2008
#
CONFIG_HAVE_DOT_CONFIG=y

#
# Busybox Settings
#

#
# General Configuration
#
CONFIG_NITPICK=y
CONFIG_FEATURE_BUFFERS_USE_MALLOC=y
CONFIG_SHOW_USAGE=y
CONFIG_FEATURE_VERBOSE_USAGE=y
CONFIG_FEATURE_COMPRESS_USAGE=y
CONFIG_FEATURE_INSTALLER=y
CONFIG_LOCALE_SUPPORT=y
CONFIG_GETOPT_LONG=y
CONFIG_FEATURE_PIDFILE=y
CONFIG_FEATURE_SUID=y
CONFIG_FEATURE_SUID_CONFIG=y
CONFIG_FEATURE_SUID_CONFIG_QUIET=y
CONFIG_BUSYBOX_EXEC_PATH="/proc/self/exe"
CONFIG_FEATURE_SYSLOG=y
CONFIG_FEATURE_HAVE_RPC=y

#
# Build Options
#
# CONFIG_STATIC is not set
# CONFIG_NOMMU is not set
# CONFIG_BUILD_LIBBUSYBOX is not set
# CONFIG_FEATURE_INDIVIDUAL is not set
```

```
# CONFIG_FEATURE_SHARED_BUSYBOX is not set
CONFIG_LFS=y

#
# Debugging Options
#
CONFIG_NO_DEBUG_LIB=y
CONFIG_INCLUDE_SUSv2=y

#
# Installation Options
#
CONFIG_INSTALL_APPLET_SYMLINKS=y
CONFIG_PREFIX="._install"

#
# Busybox Library Tuning
#
CONFIG_PASSWORD_MINLEN=6
CONFIG_MD5_SIZE_VS_SPEED=2
CONFIG_FEATURE_FAST_TOP=y
CONFIG_FEATURE_EDITING=y
CONFIG_FEATURE_EDITING_MAX_LEN=1024
CONFIG_FEATURE_EDITING_HISTORY=15
CONFIG_FEATURE_TAB_COMPLETION=y
CONFIG_FEATURE_COPYBUF_KB=4
CONFIG_IOCTL_HEX2STR_ERROR=y

#
# Applets
#

#
# Archival Utilities
#
CONFIG_AR=y
CONFIG_FEATURE_AR_LONG_FILENAMES=y
CONFIG_BUNZIP2=y
CONFIG_BZIP2=y
CONFIG_CPIO=y
CONFIG_GUNZIP=y
CONFIG_FEATURE_GUNZIP_UNCOMPRESS=y
CONFIG_GZIP=y
CONFIG_RPM2CPIO=y
CONFIG_RPM=y
CONFIG_FEATURE_RPM_BZ2=y
CONFIG_TAR=y
CONFIG_FEATURE_TAR_CREATE=y
CONFIG_FEATURE_TAR_GZIP=y
CONFIG_FEATURE_TAR_BZIP2=y
CONFIG_FEATURE_TAR_LZMA=y
CONFIG_FEATURE_TAR_COMPRESS=y
CONFIG_FEATURE_TAR_AUTODETECT=y
CONFIG_FEATURE_TAR_FROM=y
CONFIG_FEATURE_TAR_OLDGNU_COMPATIBILITY=y
CONFIG_FEATURE_TAR_OLDSUN_COMPATIBILITY=y
CONFIG_FEATURE_TAR_GNU_EXTENSIONS=y
```

```
CONFIG_FEATURE_TAR_LONG_OPTIONS=y
CONFIG_FEATURE_TAR_UNAME_GNAME=y
CONFIG_UNCOMPRESS=y
CONFIG_UNLZMA=y
CONFIG_FEATURE_LZMA_FAST=y
CONFIG_UNZIP=y

#
# Common options for cpio and tar
#
CONFIG_FEATURE_UNARCHIVE_TAPE=y
#
# Coreutils
#
CONFIG_BASENAME=y
CONFIG_CAL=y
CONFIG_CAT=y
CONFIG_CATV=y
CONFIG_CHGRP=y
CONFIG_CHMOD=y
CONFIG_CHOWN=y
CONFIG_CHROOT=y
CONFIG_CKSUM=y
CONFIG_COMM=y
CONFIG_CP=y
CONFIG_CUT=y
CONFIG_DATE=y
CONFIG_FEATURE_DATE_ISOFMT=y
CONFIG_DD=y
CONFIG_FEATURE_DD_SIGNAL_HANDLING=y
CONFIG_FEATURE_DD_IBS_OBS=y
CONFIG_DF=y
CONFIG_FEATURE_DF_INODE=y
CONFIG_DIRNAME=y
CONFIG_DOS2UNIX=y
CONFIG_UNIX2DOS=y
CONFIG_DU=y
CONFIG_FEATURE_DU_DEFAULT_BLOCKSIZE_1K=y
CONFIG_ECHO=y
CONFIG_FEATURE_FANCY_ECHO=y
CONFIG_ENV=y
CONFIG_FEATURE_ENV_LONG_OPTIONS=y
CONFIG_EXPAND=y
CONFIG_FEATURE_EXPAND_LONG_OPTIONS=y
CONFIG_EXPR=y
CONFIG_EXPR_MATH_SUPPORT_64=y
CONFIG_FALSE=y
CONFIG_FOLD=y
CONFIG_HEAD=y
CONFIG_FEATURE_FANCY_HEAD=y
CONFIG_HOSTID=y
CONFIG_ID=y
CONFIG_INSTALL=y
CONFIG_FEATURE_INSTALL_LONG_OPTIONS=y
CONFIG_LENGTH=y
CONFIG_LN=y
CONFIG_LOGNAME=y
```

CONFIG\_LS=y  
CONFIG\_FEATURE\_LS\_FILETYPES=y  
CONFIG\_FEATURE\_LS\_FOLLOWLINKS=y  
CONFIG\_FEATURE\_LS\_RECURSIVE=y  
CONFIG\_FEATURE\_LS\_SORTFILES=y  
CONFIG\_FEATURE\_LS\_TIMESTAMPS=y  
CONFIG\_FEATURE\_LS\_USERNAME=y  
CONFIG\_FEATURE\_LS\_COLOR=y  
CONFIG\_FEATURE\_LS\_COLOR\_IS\_DEFAULT=y  
CONFIG\_MD5SUM=y  
CONFIG\_MKDIR=y  
CONFIG\_FEATURE\_MKDIR\_LONG\_OPTIONS=y  
CONFIG\_MKFIFO=y  
CONFIG\_MKNOD=y  
CONFIG\_MV=y  
CONFIG\_FEATURE\_MV\_LONG\_OPTIONS=y  
CONFIG\_NICE=y  
CONFIG\_NOHUP=y  
CONFIG\_OD=y  
CONFIG\_PRINTENV=y  
CONFIG\_PRINTF=y  
CONFIG\_PWD=y  
CONFIG\_READLINK=y  
CONFIG\_FEATURE\_READLINK\_FOLLOW=y  
CONFIG\_REALPATH=y  
CONFIG\_RM=y  
CONFIG\_RMDIR=y  
CONFIG\_SEQ=y  
CONFIG\_SHA1SUM=y  
CONFIG\_SLEEP=y  
CONFIG\_FEATURE\_FANCY\_SLEEP=y  
CONFIG\_SORT=y  
CONFIG\_FEATURE\_SORT\_BIG=y  
CONFIG\_SPLIT=y  
CONFIG\_FEATURE\_SPLIT\_FANCY=y  
CONFIG\_STAT=y  
CONFIG\_FEATURE\_STAT\_FORMAT=y  
CONFIG\_STTY=y  
CONFIG\_SUM=y  
CONFIG\_SYNC=y  
CONFIG\_TAC=y  
CONFIG\_TAIL=y  
CONFIG\_FEATURE\_FANCY\_TAIL=y  
CONFIG\_TEE=y  
CONFIG\_FEATURE\_TEE\_USE\_BLOCK\_IO=y  
CONFIG\_TEST=y  
CONFIG\_FEATURE\_TEST\_64=y  
CONFIG\_TOUCH=y  
CONFIG\_TR=y  
CONFIG\_FEATURE\_TR\_CLASSES=y  
CONFIG\_FEATURE\_TR\_EQUIV=y  
CONFIG\_TRUE=y  
CONFIG\_TTY=y  
CONFIG\_UNAME=y  
CONFIG\_UNEXPAND=y  
CONFIG\_FEATURE\_UNEXPAND\_LONG\_OPTIONS=y  
CONFIG\_UNIQ=y

```
CONFIG_USLEEP=y
CONFIG_UUDECODE=y
CONFIG_UUENCODE=y
CONFIG_WC=y
CONFIG_FEATURE_WC_LARGE=y
CONFIG_WHO=y
CONFIG_WHOAMI=y
CONFIG_YES=y

#
# Common options for cp and mv
#
CONFIG_FEATURE_PRESERVE_HARDLINKS=y

#
# Common options for ls, more and telnet
#
CONFIG_FEATURE_AUTOWIDTH=y

#
# Common options for df, du, ls
#
CONFIG_FEATURE_HUMAN_READABLE=y

#
# Common options for md5sum, shasum
#
CONFIG_FEATURE_MD5_SHA1_SUM_CHECK=y

#
# Console Utilities
#
CONFIG_CHVT=y
CONFIG_CLEAR=y
CONFIG_DEALLOCVT=y
CONFIG_DUMPKMAP=y
CONFIG_KBD_MODE=y
CONFIG_LOADFONT=y
CONFIG_LOADKMAP=y
CONFIG_OPENVT=y
CONFIG_RESET=y
CONFIG_RESIZE=y
CONFIG_FEATURE_RESIZE_PRINT=y
CONFIG_SETCONSOLE=y
CONFIG_FEATURE_SETCONSOLE_LONG_OPTIONS=y
CONFIG_SETKEYCODES=y
CONFIG_SETLOGCONS=y

#
# Debian Utilities
#
CONFIG_MKTEMP=y
CONFIG_PIPE_PROGRESS=y
CONFIG_RUN_PARTS=y
CONFIG_FEATURE_RUN_PARTS_LONG_OPTIONS=y
CONFIG_FEATURE_RUN_PARTS_FANCY=y
CONFIG_START_STOP_DAEMON=y
```

```
CONFIG_FEATURE_START_STOP_DAEMON_FANCY=y
CONFIG_FEATURE_START_STOP_DAEMON_LONG_OPTIONS=y
CONFIG_WHICH=y
```

```
#
# Editors
#
CONFIG_AWK=y
CONFIG_FEATURE_AWK_MATH=y
CONFIG_CMP=y
CONFIG_DIFF=y
CONFIG_FEATURE_DIFF_BINARY=y
CONFIG_FEATURE_DIFF_DIR=y
CONFIG_FEATURE_DIFF_MINIMAL=y
CONFIG_ED=y
CONFIG_PATCH=y
CONFIG_SED=y
CONFIG_VI=y
CONFIG_FEATURE_VI_MAX_LEN=4096
# CONFIG_FEATURE_VI_8BIT is not set
CONFIG_FEATURE_VI_COLON=y
CONFIG_FEATURE_VI_YANKMARK=y
CONFIG_FEATURE_VI_SEARCH=y
CONFIG_FEATURE_VI_USE_SIGNALS=y
CONFIG_FEATURE_VI_DOT_CMD=y
CONFIG_FEATURE_VI_READONLY=y
CONFIG_FEATURE_VI_SETOPTS=y
CONFIG_FEATURE_VI_SET=y
CONFIG_FEATURE_VI_WIN_RESIZE=y
CONFIG_FEATURE_VI_OPTIMIZE_CURSOR=y
CONFIG_FEATURE_ALLOW_EXEC=y
```

```
#
# Finding Utilities
#
CONFIG_FIND=y
CONFIG_FEATURE_FIND_PRINT0=y
CONFIG_FEATURE_FIND_MTIME=y
CONFIG_FEATURE_FIND_MMIN=y
CONFIG_FEATURE_FIND_PERM=y
CONFIG_FEATURE_FIND_TYPE=y
CONFIG_FEATURE_FIND_XDEV=y
CONFIG_FEATURE_FIND_MAXDEPTH=y
CONFIG_FEATURE_FIND_NEWER=y
CONFIG_FEATURE_FIND_INUM=y
CONFIG_FEATURE_FIND_EXEC=y
CONFIG_FEATURE_FIND_USER=y
CONFIG_FEATURE_FIND_GROUP=y
CONFIG_FEATURE_FIND_NOT=y
CONFIG_FEATURE_FIND_DEPTH=y
CONFIG_FEATURE_FIND_PAREN=y
CONFIG_FEATURE_FIND_SIZE=y
CONFIG_FEATURE_FIND_PRUNE=y
CONFIG_FEATURE_FIND_DELETE=y
CONFIG_FEATURE_FIND_PATH=y
CONFIG_FEATURE_FIND_REGEX=y
# CONFIG_FEATURE_FIND_CONTEXT is not set
```

```
CONFIG_GREP=y
CONFIG_FEATURE_GREP_EGREP_ALIAS=y
CONFIG_FEATURE_GREP_FGREP_ALIAS=y
CONFIG_FEATURE_GREP_CONTEXT=y
CONFIG_XARGS=y
CONFIG_FEATURE_XARGS_SUPPORT_CONFIRMATION=y
CONFIG_FEATURE_XARGS_SUPPORT_QUOTES=y
CONFIG_FEATURE_XARGS_SUPPORT_TERMOPT=y
CONFIG_FEATURE_XARGS_SUPPORT_ZERO_TERM=y

#
# Init Utilities
#
CONFIG_INIT=y
# CONFIG_DEBUG_INIT is not set
CONFIG_FEATURE_USE_INITTAB=y
# CONFIG_FEATURE_KILL_REMOVED is not set
CONFIG_FEATURE_KILL_DELAY=0
CONFIG_FEATURE_INIT_SCTTY=y
# CONFIG_FEATURE_INIT_SYSLOG is not set
CONFIG_FEATURE_EXTRA_QUIET=y
CONFIG_FEATURE_INIT_COREDUMPS=y
CONFIG_FEATURE_INITRD=y
CONFIG_HALT=y
CONFIG_MESG=y

#
# Login/Password Management Utilities
#
CONFIG_FEATURE_SHADOWPASSWDS=y
CONFIG_USE_BB_SHADOW=y
CONFIG_USE_BB_PWD_GRP=y
CONFIG_ADDGROUP=y
CONFIG_FEATURE_ADDUSER_TO_GROUP=y
CONFIG_DELGROUP=y
CONFIG_FEATURE_DEL_USER_FROM_GROUP=y
# CONFIG_FEATURE_CHECK_NAMES is not set
CONFIG_ADDUSER=y
# CONFIG_FEATURE_ADDUSER_LONG_OPTIONS is not set
CONFIG_DELUSER=y
CONFIG_GETTY=y
CONFIG_FEATURE_UTMP=y
CONFIG_FEATURE_WTMP=y
CONFIG_LOGIN=y
# CONFIG_PAM is not set
CONFIG_LOGIN_SCRIPTS=y
CONFIG_FEATURE_NOLOGIN=y
CONFIG_FEATURE_SECURETTY=y
CONFIG_PASSWD=y
CONFIG_FEATURE_PASSWD_WEAK_CHECK=y
CONFIG_CRYPTPW=y
CONFIG_CHPASSWD=y
CONFIG_SU=y
CONFIG_FEATURE_SU_SYSLOG=y
CONFIG_FEATURE_SU_CHECKS_SHELLS=y
CONFIG_SULOGIN=y
CONFIG_VLOCK=y
```

```

#
# Linux Ext2 FS Progs
#
CONFIG_CHATTR=y
CONFIG_FSCK=y
CONFIG_LSATTR=y

#
# Linux Module Utilities
#
CONFIG_INSMOD=y
CONFIG_FEATURE_INSMOD_VERSION_CHECKING=y
CONFIG_FEATURE_INSMOD_KSYMOOPS_SYMBOLS=y
CONFIG_FEATURE_INSMOD_LOADINKMEM=y
CONFIG_FEATURE_INSMOD_LOAD_MAP=y
CONFIG_FEATURE_INSMOD_LOAD_MAP_FULL=y
CONFIG_RMMOD=y
CONFIG_LSMOD=y
CONFIG_FEATURE_LSMOD_PRETTY_2_6_OUTPUT=y
CONFIG_MODPROBE=y
CONFIG_FEATURE_MODPROBE_MULTIPLE_OPTIONS=y
CONFIG_FEATURE_MODPROBE_FANCY_ALIAS=y

#
# Options common to multiple modutils
#
CONFIG_FEATURE_CHECK_TAINTED_MODULE=y
CONFIG_FEATURE_2_4_MODULES=y
CONFIG_FEATURE_2_6_MODULES=y
# CONFIG_FEATURE_QUERY_MODULE_INTERFACE is not set

#
# Linux System Utilities
#
CONFIG_DMESG=y
CONFIG_FEATURE_DMESG_PRETTY=y
CONFIG_FBSET=y
CONFIG_FEATURE_FBSET_FANCY=y
CONFIG_FEATURE_FBSET_READMODE=y
CONFIG_FDFLUSH=y
CONFIG_FDFORMAT=y
CONFIG_FDISK=y
CONFIG_FDISK_SUPPORT_LARGE_DISKS=y
CONFIG_FEATURE_FDISK_WRITABLE=y
# CONFIG_FEATURE_AIX_LABEL is not set
# CONFIG_FEATURE_SGI_LABEL is not set
# CONFIG_FEATURE_SUN_LABEL is not set
# CONFIG_FEATURE_OSF_LABEL is not set
CONFIG_FEATURE_FDISK_ADVANCED=y
# CONFIG_FINDFS is not set
CONFIG_FREERAMDISK=y
CONFIG_FSCK_MINIX=y
CONFIG_MKFS_MINIX=y

#
# Minix filesystem support

```

```
#
CONFIG_FEATURE_MINIX2=y
CONFIG_GETOPT=y
CONFIG_HEXDUMP=y
# CONFIG_FEATURE_HEXDUMP_REVERSE is not set
# CONFIG_HD is not set
CONFIG_HWCLOCK=y
CONFIG_FEATURE_HWCLOCK_LONG_OPTIONS=y
CONFIG_FEATURE_HWCLOCK_ADJTIME_FHS=y
CONFIG_IPCRM=y
CONFIG_IPCS=y
CONFIG_LOSETUP=y
CONFIG_MDEV=y
CONFIG_FEATURE_MDEV_CONF=y
CONFIG_FEATURE_MDEV_RENAME=y
CONFIG_FEATURE_MDEV_EXEC=y
CONFIG_FEATURE_MDEV_LOAD_FIRMWARE=y
CONFIG_MKSWAP=y
CONFIG_FEATURE_MKSWAP_V0=y
CONFIG_MORE=y
CONFIG_FEATURE_USE_TERMIOS=y
# CONFIG_VOLUMEID is not set
# CONFIG_FEATURE_VOLUMEID_EXT is not set
# CONFIG_FEATURE_VOLUMEID_REISERFS is not set
# CONFIG_FEATURE_VOLUMEID_FAT is not set
# CONFIG_FEATURE_VOLUMEID_HFS is not set
# CONFIG_FEATURE_VOLUMEID_JFS is not set
# CONFIG_FEATURE_VOLUMEID_XFS is not set
# CONFIG_FEATURE_VOLUMEID_NTFS is not set
# CONFIG_FEATURE_VOLUMEID_ISO9660 is not set
# CONFIG_FEATURE_VOLUMEID_UDF is not set
# CONFIG_FEATURE_VOLUMEID_LUKS is not set
# CONFIG_FEATURE_VOLUMEID_LINUXSWAP is not set
# CONFIG_FEATURE_VOLUMEID_CRAMFS is not set
# CONFIG_FEATURE_VOLUMEID_ROMFS is not set
# CONFIG_FEATURE_VOLUMEID_SYSV is not set
# CONFIG_FEATURE_VOLUMEID_OCFS2 is not set
# CONFIG_FEATURE_VOLUMEID_LINUXRAID is not set
CONFIG_MOUNT=y
CONFIG_FEATURE_MOUNT_FAKE=y
CONFIG_FEATURE_MOUNT_VERBOSE=y
# CONFIG_FEATURE_MOUNT_HELPERS is not set
# CONFIG_FEATURE_MOUNT_LABEL is not set
CONFIG_FEATURE_MOUNT_NFS=y
CONFIG_FEATURE_MOUNT_CIFS=y
CONFIG_FEATURE_MOUNT_FLAGS=y
CONFIG_FEATURE_MOUNT_FSTAB=y
CONFIG_PIVOT_ROOT=y
CONFIG_RDATE=y
CONFIG_READPROFILE=y
# CONFIG_RTCWAKE is not set
CONFIG_SETARCH=y
CONFIG_SWAPONOFF=y
CONFIG_SWITCH_ROOT=y
CONFIG_UMOUNT=y
CONFIG_FEATURE_UMOUNT_ALL=y
```

```
#
# Common options for mount/umount
#
CONFIG_FEATURE_MOUNT_LOOP=y
# CONFIG_FEATURE_MTAB_SUPPORT is not set

#
# Miscellaneous Utilities
#
CONFIG_ADJTIMEX=y
# CONFIG_BBCONFIG is not set
# CONFIG_CHAT is not set
# CONFIG_FEATURE_CHAT_NOFAIL is not set
# CONFIG_FEATURE_CHAT_TTY_HIFI is not set
# CONFIG_FEATURE_CHAT_IMPLICIT_CR is not set
# CONFIG_FEATURE_CHAT_SWALLOW_OPTS is not set
# CONFIG_FEATURE_CHAT_SEND_ESCAPES is not set
# CONFIG_FEATURE_CHAT_VAR_ABORT_LEN is not set
# CONFIG_FEATURE_CHAT_CLR_ABORT is not set
CONFIG_CHRT=y
CONFIG_CROND=y
# CONFIG_DEBUG_CROND_OPTION is not set
CONFIG_FEATURE_CROND_CALL_SENDMAIL=y
CONFIG_CRONTAB=y
CONFIG_DC=y
# CONFIG_DEVFSD is not set
# CONFIG_DEVFSD_MODLOAD is not set
# CONFIG_DEVFSD_FG_NP is not set
# CONFIG_DEVFSD_VERBOSE is not set
# CONFIG_FEATURE_DEVFS is not set
CONFIG_EJECT=y
CONFIG_FEATURE_EJECT_SCSI=y
CONFIG_LAST=y
CONFIG_LESS=y
CONFIG_FEATURE_LESS_MAXLINES=9999999
CONFIG_FEATURE_LESS_BRACKETS=y
CONFIG_FEATURE_LESS_FLAGS=y
CONFIG_FEATURE_LESS_FLAGCS=y
CONFIG_FEATURE_LESS_MARKS=y
CONFIG_FEATURE_LESS_REGEXP=y
CONFIG_HDPARM=y
CONFIG_FEATURE_HDPARM_GET_IDENTITY=y
CONFIG_FEATURE_HDPARM_HDIO_SCAN_HWIF=y
CONFIG_FEATURE_HDPARM_HDIO_UNREGISTER_HWIF=y
CONFIG_FEATURE_HDPARM_HDIO_DRIVE_RESET=y
CONFIG_FEATURE_HDPARM_HDIO_TRISTATE_HWIF=y
CONFIG_FEATURE_HDPARM_HDIO_GETSET_DMA=y
CONFIG_MAKEDEVFS=y
# CONFIG_FEATURE_MAKEDEVFS_LEAF is not set
CONFIG_FEATURE_MAKEDEVFS_TABLE=y
CONFIG_MICROCOM=y
CONFIG_MOUNTPOINT=y
CONFIG_MT=y
CONFIG_RAIDAUTORUN=y
CONFIG_READAHEAD=y
CONFIG_RUNLEVEL=y
CONFIG_RX=y
```

```
CONFIG_SCRIPT=y
CONFIG_STRINGS=y
CONFIG_SETSID=y
CONFIG_TASKSET=y
CONFIG_FEATURE_TASKSET_FANCY=y
CONFIG_TIME=y
CONFIG_TTYSIZE=y
CONFIG_WATCHDOG=y

#
# Networking Utilities
#
CONFIG_FEATURE_IPV6=y
CONFIG_FEATURE_PREFER_IPV4_ADDRESS=y
CONFIG_VERBOSE_RESOLUTION_ERRORS=y
CONFIG_ARP=y
CONFIG_ARPING=y
CONFIG_BRCTL=y
CONFIG_FEATURE_BRCTL_FANCY=y
CONFIG_DNSD=y
CONFIG_ETHER_WAKE=y
CONFIG_FAKEIDENTD=y
CONFIG_FTPGET=y
CONFIG_FTPPUT=y
CONFIG_FEATURE_FTPGETPUT_LONG_OPTIONS=y
CONFIG_HOSTNAME=y
CONFIG_HTTPD=y
CONFIG_FEATURE_HTTPD_RANGES=y
CONFIG_FEATURE_HTTPD_USE_SENDFILE=y
CONFIG_FEATURE_HTTPD_RELOAD_CONFIG_SIGHUP=y
CONFIG_FEATURE_HTTPD_SETUID=y
CONFIG_FEATURE_HTTPD_BASIC_AUTH=y
CONFIG_FEATURE_HTTPD_AUTH_MD5=y
CONFIG_FEATURE_HTTPD_CONFIG_WITH_MIME_TYPES=y
CONFIG_FEATURE_HTTPD_CGI=y
CONFIG_FEATURE_HTTPD_CONFIG_WITH_SCRIPT_INTERPR=y
CONFIG_FEATURE_HTTPD_SET_REMOTE_PORT_TO_ENV=y
CONFIG_FEATURE_HTTPD_ENCODE_URL_STR=y
CONFIG_FEATURE_HTTPD_ERROR_PAGES=y
CONFIG_FEATURE_HTTPD_PROXY=y
CONFIG_IFCONFIG=y
CONFIG_FEATURE_IFCONFIG_STATUS=y
CONFIG_FEATURE_IFCONFIG_SLIP=y
CONFIG_FEATURE_IFCONFIG_MEMSTART_IOADDR_IRQ=y
CONFIG_FEATURE_IFCONFIG_HW=y
CONFIG_FEATURE_IFCONFIG_BROADCAST_PLUS=y
CONFIG_IFENSLAVE=y
CONFIG_IFUPDOWN=y
CONFIG_IFUPDOWN_IFSTATE_PATH="/var/run/ifstate"
CONFIG_FEATURE_IFUPDOWN_IP=y
CONFIG_FEATURE_IFUPDOWN_IP_BUILTIN=y
# CONFIG_FEATURE_IFUPDOWN_IFCONFIG_BUILTIN is not set
CONFIG_FEATURE_IFUPDOWN_IPV4=y
# CONFIG_FEATURE_IFUPDOWN_IPV6 is not set
CONFIG_FEATURE_IFUPDOWN_MAPPING=y
# CONFIG_FEATURE_IFUPDOWN_EXTERNAL_DHCP is not set
CONFIG_INETD=y
```

```
CONFIG_FEATURE_INETD_SUPPORT_BUILTIN_ECHO=y
CONFIG_FEATURE_INETD_SUPPORT_BUILTIN_DISCARD=y
CONFIG_FEATURE_INETD_SUPPORT_BUILTIN_TIME=y
CONFIG_FEATURE_INETD_SUPPORT_BUILTIN_DAYTIME=y
CONFIG_FEATURE_INETD_SUPPORT_BUILTIN_CHARGEN=y
# CONFIG_FEATURE_INETD_RPC is not set
CONFIG_IP=y
CONFIG_FEATURE_IP_ADDRESS=y
CONFIG_FEATURE_IP_LINK=y
CONFIG_FEATURE_IP_ROUTE=y
CONFIG_FEATURE_IP_TUNNEL=y
CONFIG_FEATURE_IP_RULE=y
CONFIG_FEATURE_IP_SHORT_FORMS=y
# CONFIG_FEATURE_IP_RARE_PROTOCOLS is not set
CONFIG_IPADDR=y
CONFIG_IPLINK=y
CONFIG_IPROUTE=y
CONFIG_IPTUNNEL=y
CONFIG_IPRULE=y
CONFIG_IPCALC=y
CONFIG_FEATURE_IPCALC_FANCY=y
CONFIG_FEATURE_IPCALC_LONG_OPTIONS=y
CONFIG_NAMEIF=y
# CONFIG_FEATURE_NAMEIF_EXTENDED is not set
CONFIG_NC=y
CONFIG_NC_SERVER=y
CONFIG_NC_EXTRA=y
CONFIG_NETSTAT=y
CONFIG_FEATURE_NETSTAT_WIDE=y
CONFIG_NSLOOKUP=y
CONFIG_PING=y
# CONFIG_PING6 is not set
CONFIG_FEATURE_FANCY_PING=y
CONFIG_PSCAN=y
CONFIG_ROUTE=y
CONFIG_SENDMAIL=y
CONFIG_FETCHMAIL=y
CONFIG_SLATTACH=y
CONFIG_TELNET=y
CONFIG_FEATURE_TELNET_TTYPE=y
CONFIG_FEATURE_TELNET_AUTOLOGIN=y
CONFIG_TELNETD=y
CONFIG_FEATURE_TELNETD_STANDALONE=y
CONFIG_TFTP=y
CONFIG_TFTPD=y
CONFIG_FEATURE_TFTP_GET=y
CONFIG_FEATURE_TFTP_PUT=y
CONFIG_FEATURE_TFTP_BLOCKSIZE=y
# CONFIG_DEBUG_TFTP is not set
CONFIG_TRACEROUTE=y
# CONFIG_FEATURE_TRACEROUTE_VERBOSE is not set
# CONFIG_FEATURE_TRACEROUTE_SOURCE_ROUTE is not set
# CONFIG_FEATURE_TRACEROUTE_USE_ICMP is not set
CONFIG_APP_UDHCPD=y
CONFIG_APP_DHCPRELAY=y
CONFIG_APP_DUMPLEASES=y
CONFIG_FEATURE_UDHCPD_WRITE_LEASES_EARLY=y
```

```

CONFIG_DHCPD_LEASES_FILE="/var/lib/misc/udhcpd.leases"
CONFIG_APP_UDHCPC=y
CONFIG_FEATURE_UDHCPC_ARPING=y
# CONFIG_FEATURE_UDHCP_PORT is not set
# CONFIG_FEATURE_UDHCP_DEBUG is not set
CONFIG_FEATURE_RFC3397=y
CONFIG_DHCP_DEFAULT_SCRIPT="/usr/share/udhcp/default.script"
CONFIG_UDHCPC_SLACK_FOR_BUGGY_SERVERS=80
CONFIG_VCONFIG=y
CONFIG_WGET=y
CONFIG_FEATURE_WGET_STATUSBAR=y
CONFIG_FEATURE_WGET_AUTHENTICATION=y
CONFIG_FEATURE_WGET_LONG_OPTIONS=y
CONFIG_ZCIP=y
CONFIG_TCPSVD=y
CONFIG_UDPSVD=y

#
# Process Utilities
#
CONFIG_FREE=y
CONFIG_FUSER=y
CONFIG_KILL=y
CONFIG_KILLALL=y
CONFIG_KILLALL5=y
CONFIG_NMETER=y
CONFIG_PGREP=y
CONFIG_PIDOF=y
CONFIG_FEATURE_PIDOF_SINGLE=y
CONFIG_FEATURE_PIDOF_OMIT=y
CONFIG_PKILL=y
CONFIG_PS=y
CONFIG_FEATURE_PS_WIDE=y
# CONFIG_FEATURE_PS_TIME is not set
# CONFIG_FEATURE_PS_UNUSUAL_SYSTEMS is not set
CONFIG_RENICE=y
CONFIG_BB_SYSCTL=y
CONFIG_TOP=y
CONFIG_FEATURE_TOP_CPU_USAGE_PERCENTAGE=y
CONFIG_FEATURE_TOP_CPU_GLOBAL_PERCENTS=y
# CONFIG_FEATURE_TOP_DECIMALS is not set
CONFIG_FEATURE_TOPMEM=y
CONFIG_UPTIME=y
CONFIG_WATCH=y

#
# Shells
#
CONFIG_FEATURE_SH_IS_ASH=y
# CONFIG_FEATURE_SH_IS_HUSH is not set
# CONFIG_FEATURE_SH_IS_MSH is not set
# CONFIG_FEATURE_SH_IS_NONE is not set
CONFIG_ASH=y

#
# Ash Shell Options
#

```

```
CONFIG_ASH_JOB_CONTROL=y
CONFIG_ASH_READ_NCHARS=y
CONFIG_ASH_READ_TIMEOUT=y
# CONFIG_ASH_ALIAS is not set
CONFIG_ASH_MATH_SUPPORT=y
CONFIG_ASH_MATH_SUPPORT_64=y
# CONFIG_ASH_GETOPTS is not set
CONFIG_ASH_BUILTIN_ECHO=y
CONFIG_ASH_BUILTIN_TEST=y
CONFIG_ASH_CMDCMD=y
# CONFIG_ASH_MAIL is not set
CONFIG_ASH_OPTIMIZE_FOR_SIZE=y
CONFIG_ASH_RANDOM_SUPPORT=y
# CONFIG_ASH_EXPAND_PRMT is not set
# CONFIG_HUSH is not set
# CONFIG_HUSH_HELP is not set
# CONFIG_HUSH_INTERACTIVE is not set
# CONFIG_HUSH_JOB is not set
# CONFIG_HUSH_TICK is not set
# CONFIG_HUSH_IF is not set
# CONFIG_HUSH_LOOPS is not set
# CONFIG_LASH is not set
# CONFIG_MSH is not set

#
# Bourne Shell Options
#
CONFIG_FEATURE_SH_EXTRA_QUIET=y
# CONFIG_FEATURE_SH_STANDALONE is not set
# CONFIG_CTTYHACK is not set

#
# System Logging Utilities
#
CONFIG_SYSLOGD=y
CONFIG_FEATURE_ROTATE_LOGFILE=y
CONFIG_FEATURE_REMOTE_LOG=y
# CONFIG_FEATURE_SYSLOGD_DUP is not set
CONFIG_FEATURE_IPC_SYSLOG=y
CONFIG_FEATURE_IPC_SYSLOG_BUFFER_SIZE=16
CONFIG_LOGREAD=y
CONFIG_FEATURE_LOGREAD_REDUCED_LOCKING=y
CONFIG_KLOGD=y
CONFIG_LOGGER=y

#
# Runit Utilities
#
CONFIG_RUNSV=y
CONFIG_RUNSVDIR=y
CONFIG_SV=y
CONFIG_SVLOGD=y
CONFIG_CHPST=y
CONFIG_SETUIDGID=y
CONFIG_ENVUIDGID=y
CONFIG_ENVDIR=y
CONFIG_SOFTLIMIT=y
```

```
# CONFIG_CHCON is not set
# CONFIG_FEATURE_CHCON_LONG_OPTIONS is not set
# CONFIG_GETENFORCE is not set
# CONFIG_GETSEBOOL is not set
# CONFIG_LOAD_POLICY is not set
# CONFIG_MATCHPATHCON is not set
# CONFIG_RESTORECON is not set
# CONFIG_RUNCON is not set
# CONFIG_FEATURE_RUNCON_LONG_OPTIONS is not set
# CONFIG_SELINUXENABLED is not set
# CONFIG_SETENFORCE is not set
# CONFIG_SETFILES is not set
# CONFIG_FEATURE_SETFILES_CHECK_OPTION is not set
# CONFIG_SETSEBOOL is not set
# CONFIG_SESTATUS is not set

#
# Print Utilities
#
CONFIG_LPD=y
CONFIG_LPR=y
CONFIG_LPQ=y
```