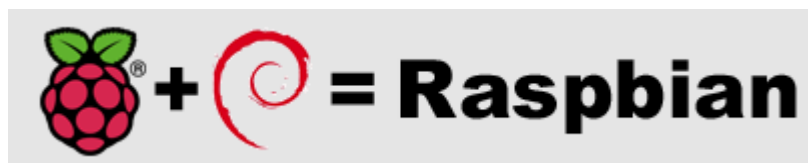


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SD root で Raspbian を使う



SDカードに [Raspbian^{1\)}](#) を導入して使用してみます。Debian ベースですので、

- apt-get でパッケージが導入できる
- Raspberry Pi に最適化しているため、素の Debian よりも高い性能が期待できる (浮動小数点の演算が特に高速化されます)

というメリットがあります。

また、SDカードに全ファイルシステムが入りますので、

- 本体が故障した際に、本体交換だけで済む (再セッティングなどが不要)

というメリットも(用途によっては)あるかと思います。

セットアップ

SDカードの作成

SD カードを rootfs とするために、SD カードを下記フォーマットで初期化します。

- partition は 1 つ以上
- 一番目の partition を ext3 とする

fdisk での partition 作成

Linux の PC で fdisk により partition を作成します。"/dev/sdd" の部分は、環境により異なります。

```
ubuntu ~ # fdisk /dev/sdd
```

```
コマンド (m でヘルプ): p
```

```
ディスク /dev/sdd: 2002 MB, 2002780160 バイト  
ヘッド 4, セクタ 2, シリンダ 488960, 合計 3911680 セクタ  
Units = セクタ数 of 1 * 512 = 512 バイト  
セクタサイズ (論理 / 物理): 512 バイト / 512 バイト  
I/O サイズ (最小 / 推奨): 512 バイト / 512 バイト  
ディスク識別子: 0x00000000
```

デバイス	ブート	始点	終点	ブロック	Id	システム
/dev/sdd1	*		2048	3911679	1954816	c W95 FAT32 (LBA)

コマンド (m でヘルプ): t

選択したパーティション 1

16進数コード (L コマンドでコードリスト表示): 83

パーティションのシステムタイプを 1 から 83 (Linux) に変更しました

コマンド (m でヘルプ): p

ディスク /dev/sdd: 2002 MB, 2002780160 バイト

ヘッド 4, セクタ 2, シリンダ 488960, 合計 3911680 セクタ

Units = セクタ数 of 1 * 512 = 512 バイト

セクタサイズ (論理 / 物理): 512 バイト / 512 バイト

I/O サイズ (最小 / 推奨): 512 バイト / 512 バイト

ディスク識別子: 0x00000000

デバイス	ブート	始点	終点	ブロック	Id	システム
/dev/sdd1	*		2048	3911679	1954816	83 Linux

コマンド (m でヘルプ): w

パーティションテーブルは変更されました！

ioctl() を呼び出してパーティションテーブルを再読み込みします。

ディスクを同期しています。

ubuntu ~ #

Filesystem の作成

mkfs.ext3 コマンドで、ext3 filesystem を作成します。

inode の数が不足しないよう“-i 4096” オプションをつけています。

```
ubuntu ~ # mkfs.ext3 -m 0 -i 4096 /dev/sdd1
mke2fs 1.42.8 (20-Jun-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
488880 inodes, 488704 blocks
0 blocks (0.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=503316480
15 block groups
32768 blocks per group, 32768 fragments per group
32592 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912
```

```
Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

ubuntu ~ #
```

rootfs filesystem の展開

[ダウンロード - MA-E2xx シリーズ](#) から Raspbian の rootfs archive をダウンロードし、SD カードに展開します。

```
ubuntu ~ # mount /dev/sdd1 /mnt/sd/
ubuntu ~ # cd /mnt/sd/
ubuntu sd # tar axfp /PATH-T0-
DOWNLOADED/mae2xx_sdroot_raspbian_20140825.tar.xz
ubuntu sd # cd
ubuntu ~ # umount /mnt/sd
```

本体 Kernel の更新

Raspbian は、MA-E2xx 標準の 2.6.28.x Kernel では動作しませんので 3.2.x の Kernel に更新します。ビルド済みイメージファイルを SD カードの中に同梱してありますので、それを書き込みます。

本体のファームウェアでの起動

まず DIPSW-1 を On にして、本体 FlashMemory のファームウェアで起動します。起動したら root で login します。

```
This is MAE2xx.unknown_domain (Linux armv6l 2.6.28.10-Magnolia2) 11:54:05

MAE2xx login: root
Password:
MAE2xx ~ #
```

作成した SD カードの mount

さきほど作成した SD カードを挿入し、mount します。

/home ディレクトリに Kernel のイメージファイルがあることが確認できます。

```
MAE2xx ~ # mount /dev/mmcblk0p1 /mnt/sd/
MAE2xx ~ # cd /mnt/sd/
MAE2xx sd # ls home/user1/
uImage-3.2.62-MAE2xx
MAE2xx sd #
```

Kernel の更新

flashcp コマンドで、本体 FlashMemory の Kernel を更新します。

```
MAE2xx sd # flashcp -v home/user1/uImage-3.2.62-MAE2xx /dev/mtd3
Erasing blocks: 20/20 (100%)
Writing data: 2551k/2551k (100%)
Verifying data: 2551k/2551k (100%)
MAE2xx sd #
```

再起動

更新が完了したら□DIPSW-3 のみ On (SD カード rootfs) に変更し、再起動します。

```
MAE2xx sd # reboot

Broadcast message from root@MAE2xx (ttymxc2) (Mon Aug 25 11:57:41 2014):

The system is going down for reboot NOW!
```

Rapbian での起動

起動すると、コンソールには下記のような出力がされています。

```
[....] Cleaning up temporary files.... ok
[....] Setting up ALSA...done.
[....] Setting up X socket directories... /tmp/.X11-unix /tmp/.ICE-unix. ok
INIT: Entering runlevel: 2
[info] Using makefile-style concurrent boot in runlevel 2.
[....] Starting enhanced syslogd: rsyslogd. ok
[....] Starting periodic command scheduler: cron. ok
[....] Starting OpenBSD Secure Shell server: sshd. ok
```

Raspbian GNU/Linux 7 raspbian ttymxc2

raspbian login:

各種設定

初期状態では、下記のとおり設定してあります。

Kind	Item	Value	Note
Network	IP Address	192.168.253.253	
	Netmask	255.255.255.0	
Account	一般ユーザ	user1 / (pw)user1	sudo 可能
	root	root / (pw)root	

導入済みパッケージ一覧

下記パッケージを導入してあります。

```
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/halF-conf/Half-inst/trig-aWait/Trig-
pend
|/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
||/ Name                               Version
Architecture Description
+++-----
=====
=====
==
ii  adduser                               3.113+nmu3                all
add and remove users and groups
ii  alsa-base                             1.0.25+3~deb7u1           all
ALSA driver configuration files
ii  alsa-utils                             1.0.25-4                  armhf
Utilities for configuring and using ALSA
ii  apt                                    0.9.7.9+rpil+deb7u2       armhf
commandline package manager
ii  apt-utils                             0.9.7.9+rpil+deb7u2       armhf
package managment related utility programs
ii  aptitude                              0.6.8.2-1                 armhf
terminal-based package manager
ii  aptitude-common                       0.6.8.2-1                 all
architecture indepedent files for the aptitude package manager
ii  base-files                             7.1wheezy6+rpil           armhf
Debian base system miscellaneous files
ii  base-passwd                            3.5.26                    armhf
Debian base system master password and group files
```

ii	bash	4.2+dfsg-0.1	armhf
	GNU Bourne Again SHell		
ii	binutils	2.22-8	armhf
	GNU assembler, linker and binary utilities		
ii	bsdmainutils	9.0.3	armhf
	collection of more utilities from FreeBSD		
ii	bsdutils	1:2.20.1-5.3	armhf
	Basic utilities from 4.4BSD-Lite		
ii	build-essential	11.5+b1	armhf
	Informational list of build-essential packages		
ii	bzip2	1.0.6-4	armhf
	high-quality block-sorting file compressor - utilities		
ii	ca-certificates	20130119	all
	Common CA certificates		
ii	comerr-dev	2.1-1.42.5-1.1	armhf
	common error description library - headers and static libraries		
ii	coreutils	8.13-3.5	armhf
	GNU core utilities		
ii	cpio	2.11+dfsg-0.1	armhf
	GNU cpio -- a program to manage archives of files		
ii	cpp	4:4.6.3-8	armhf
	GNU C preprocessor (cpp)		
ii	cpp-4.6	4.6.3-14+rpil	armhf
	GNU C preprocessor		
ii	cron	3.0pl1-124	armhf
	process scheduling daemon		
ii	curl	7.26.0-1+wheezy9	armhf
	command line tool for transferring data with URL syntax		
ii	dash	0.5.7-3	armhf
	POSIX-compliant shell		
ii	debconf	1.5.49	all
	Debian configuration management system		
ii	debconf-i18n	1.5.49	all
	full internationalization support for debconf		
ii	debianutils	4.3.2	armhf
	Miscellaneous utilities specific to Debian		
ii	diffutils	1:3.2-6	armhf
	File comparison utilities		
ii	dpkg	1.16.15+rpil	armhf
	Debian package management system		
ii	dpkg-dev	1.16.15+rpil	all
	Debian package development tools		
ii	e2fslibs:armhf	1.42.5-1.1	armhf
	ext2/ext3/ext4 file system libraries		
ii	e2fsprogs	1.42.5-1.1	armhf
	ext2/ext3/ext4 file system utilities		
ii	fakeroot	1.18.4-2	armhf
	tool for simulating superuser privileges		
ii	file	5.11-2+deb7u3	armhf
	Determines file type using "magic" numbers		
ii	findutils	4.4.2-4	armhf

```

utilities for finding files--find, xargs
ii g++                                4:4.6.3-8                        armhf
GNU C++ compiler
ii g++-4.6                            4.6.3-14+rpil                   armhf
GNU C++ compiler
ii gcc                                4:4.6.3-8                        armhf
GNU C compiler
ii gcc-4.5-base:armhf                 4.5.3-12+rpil                   armhf
The GNU Compiler Collection (base package)
ii gcc-4.6                            4.6.3-14+rpil                   armhf
GNU C compiler
ii gcc-4.6-base:armhf                 4.6.3-14+rpil                   armhf
GCC, the GNU Compiler Collection (base package)
ii gcc-4.7-base:armhf                 4.7.2-5+rpil                    armhf
GCC, the GNU Compiler Collection (base package)
ii gnupg                              1.4.12-7+deb7u4                 armhf
GNU privacy guard - a free PGP replacement
ii gpgv                              1.4.12-7+deb7u4                 armhf
GNU privacy guard - signature verification tool
ii grep                               2.12-2                           armhf
GNU grep, egrep and fgrep
ii groff-base                         1.21-9                           armhf
GNU troff text-formatting system (base system components)
ii gzip                               1.5-1.1                         armhf
GNU compression utilities
ii hostname                           3.11                             armhf
utility to set/show the host name or domain name
ii ifupdown                           0.7.8                           armhf
high level tools to configure network interfaces
ii info                               4.13a.dfsg.1-10                 armhf
Standalone GNU Info documentation browser
ii initramfs-tools                    0.115~bpo70+1                   all
generic modular initramfs generator
ii initscripts                        2.88dsf-41+deb7u1               armhf
scripts for initializing and shutting down the system
ii insserv                            1.14.0-5                        armhf
boot sequence organizer using LSB init.d script dependency information
ii install-info                       4.13a.dfsg.1-10                 armhf
Manage installed documentation in info format
ii iproute                            20120521-3                       armhf
networking and traffic control tools
ii iptables                           1.4.14-3.1                       armhf
administration tools for packet filtering and NAT
ii iputils-ping                       3:20101006-1                     armhf
Tools to test the reachability of network hosts
ii ipython3                           0.13.1-2                         all
enhanced interactive Python 3 shell
ii isc-dhcp-client                     4.2.2.dfsg.1-5+deb70u6           armhf
ISC DHCP client
ii isc-dhcp-common                     4.2.2.dfsg.1-5+deb70u6           armhf
common files used by all the isc-dhcp* packages

```

ii	klibc-utils	2.0.1-3.1+rpil	armhf
small utilities built with klibc for early boot			
ii	kmod	9-3	armhf
tools for managing Linux kernel modules			
ii	krb5-locales	1.10.1+dfsg-5+deb7u2	all
Internationalization support for MIT Kerberos			
ii	krb5-multidev	1.10.1+dfsg-5+deb7u2	armhf
Development files for MIT Kerberos without Heimdal conflict			
ii	lame	3.99.5+repack1-3	armhf
MP3 encoding library (frontend)			
ii	less	444-4	armhf
pager program similar to more			
ii	libacl:armhf	2.2.51-8	armhf
Access control list shared library			
ii	libalgorithm-diff-perl	1.19.02-2	all
module to find differences between files			
ii	libalgorithm-diff-xs-perl	0.04-2	armhf
module to find differences between files (XS accelerated)			
ii	libalgorithm-merge-perl	0.08-2	all
Perl module for three-way merge of textual data			
ii	libao-common	1.1.0-2	armhf
Cross Platform Audio Output Library (Common files)			
ii	libao4	1.1.0-2	armhf
Cross Platform Audio Output Library			
ii	libapt-inst1.5:armhf	0.9.7.9+rpil+deb7u2	armhf
deb package format runtime library			
ii	libapt-pkg-dev:armhf	0.9.7.9+rpil+deb7u2	armhf
development files for APT's libapt-pkg and libapt-inst			
ii	libapt-pkg4.12:armhf	0.9.7.9+rpil+deb7u2	armhf
package managment runtime library			
ii	libasound2:armhf	1.0.25-4	armhf
shared library for ALSA applications			
ii	libasound2-plugins:armhf	1.0.25-2	armhf
ALSA library additional plugins			
ii	libasyncons0:armhf	0.8-4	armhf
Asynchronous name service query library			
ii	libattr1:armhf	1:2.4.46-8	armhf
Extended attribute shared library			
ii	libavcodec53:armhf	6:0.8.13-1+rpil	armhf
Libav codec library			
ii	libavformat53:armhf	6:0.8.13-1+rpil	armhf
Libav file format library			
ii	libavutil51:armhf	6:0.8.13-1+rpil	armhf
Libav utility library			
ii	libblkid1:armhf	2.20.1-5.3	armhf
block device id library			
ii	libboost-iostreams1.46.1	1.46.1-8	armhf
Boost.Iostreams Library			
ii	libboost-iostreams1.48.0	1.48.0-3	armhf
Boost.Iostreams Library			
ii	libboost-iostreams1.49.0	1.49.0-3.2	armhf

```

Boost.Iostreams Library
ii  libboost-iostreams1.50.0      1.50.0-1      armhf
Boost.Iostreams Library
ii  libbsd0:armhf                 0.4.2-1      armhf
utility functions from BSD systems - shared library
ii  libbz2-1.0:armhf             1.0.6-4      armhf
high-quality block-sorting file compressor library - runtime
ii  libc-bin                      2.13-38+rpi2+deb7u3  armhf
Embedded GNU C Library: Binaries
ii  libc-dev-bin                  2.13-38+rpi2+deb7u3  armhf
Embedded GNU C Library: Development binaries
ii  libc6:armhf                   2.13-38+rpi2+deb7u3  armhf
Embedded GNU C Library: Shared libraries
ii  libc6-dev:armhf               2.13-38+rpi2+deb7u3  armhf
Embedded GNU C Library: Development Libraries and Header Files
ii  libcap2:armhf                 1:2.22-1.2     armhf
support for getting/setting POSIX.1e capabilities
ii  libclass-isa-perl             0.36-3         all
report the search path for a class's ISA tree
ii  libcomerr2:armhf              1.42.5-1.1     armhf
common error description library
ii  libcurl3:armhf                7.26.0-1+wheezy9   armhf
easy-to-use client-side URL transfer library (OpenSSL flavour)
ii  libcurl4-openssl-dev          7.26.0-1+wheezy9   armhf
development files and documentation for libcurl (OpenSSL flavour)
ii  libcwid3                       0.5.16-3.4      armhf
high-level terminal interface library for C++ (runtime files)
ii  libdb5.1:armhf                5.1.29-5        armhf
Berkeley v5.1 Database Libraries [runtime]
ii  libdbus-1-3:armhf             1.6.8-1+deb7u3    armhf
simple interprocess messaging system (library)
ii  libdirac-encoder0:armhf        1.0.2-6         armhf
open and royalty free high quality video codec - encoder library
ii  libdpg-perl                   1.16.15+rpi1     all
Dpkg perl modules
ii  libedit2:armhf                2.11-20080614-5   armhf
BSD editline and history libraries
ii  libept-dev                     1.0.9           armhf
High-level library for managing Debian package information
ii  libept1.4.12                  1.0.9           armhf
High-level library for managing Debian package information
ii  libexif12:armhf                0.6.20-3        armhf
library to parse EXIF files
ii  libexpat1:armhf                2.1.0-1+deb7u1    armhf
XML parsing C library - runtime library
ii  libexpat1-dev                  2.1.0-1+deb7u1    armhf
XML parsing C library - development kit
ii  libffi5:armhf                  3.0.10-3+b3      armhf
Foreign Function Interface library runtime
ii  libfile-fcntllock-perl         0.14-2          armhf
Perl module for file locking with fcntl(2)

```

ii	libflac8:armhf	1.2.1-6	armhf
Free Lossless Audio Codec - runtime C library			
ii	libgcc1:armhf	1:4.7.2-5+rpil	armhf
GCC support library			
ii	libgcrypt11:armhf	1.5.0-5+deb7u1	armhf
LGPL Crypto library - runtime library			
ii	libgcrypt11-dev	1.5.0-5+deb7u1	armhf
LGPL Crypto library - development files			
ii	libgdbm3:armhf	1.8.3-11	armhf
GNU dbm database routines (runtime version)			
ii	libglib2.0-0:armhf	2.33.12+really2.32.4-5	armhf
GLib library of C routines			
ii	libglib2.0-data	2.33.12+really2.32.4-5	all
Common files for GLib library			
ii	libgmp10:armhf	2:5.0.5+dfsg-2	armhf
Multiprecision arithmetic library			
ii	libgnutls-dev	2.12.20-8+deb7u2	armhf
GNU TLS library - development files			
ii	libgnutls-openssl27:armhf	2.12.20-8+deb7u2	armhf
GNU TLS library - OpenSSL wrapper			
ii	libgnutls26:armhf	2.12.20-8+deb7u2	armhf
GNU TLS library - runtime library			
ii	libgnutlsxx27:armhf	2.12.20-8+deb7u2	armhf
GNU TLS library - C++ runtime library			
ii	libgomp1:armhf	4.7.2-5+rpil	armhf
GCC OpenMP (GOMP) support library			
ii	libgpg-error-dev	1.10-3.1	armhf
library for common error values and messages in GnuPG components (development)			
ii	libgpg-error0:armhf	1.10-3.1	armhf
library for common error values and messages in GnuPG components			
ii	libgsm1:armhf	1.0.13-4	armhf
Shared libraries for GSM speech compressor			
ii	libgssapi-krb5-2:armhf	1.10.1+dfsg-5+deb7u2	armhf
MIT Kerberos runtime libraries - krb5 GSS-API Mechanism			
ii	libgssrpc4:armhf	1.10.1+dfsg-5+deb7u2	armhf
MIT Kerberos runtime libraries - GSS enabled ONCRPC			
ii	libice6:armhf	2:1.0.8-2	armhf
X11 Inter-Client Exchange library			
ii	libid3tag0	0.15.1b-10	armhf
ID3 tag reading library from the MAD project			
ii	libident	0.22-3	armhf
simple RFC1413 client library - runtime			
ii	libidn11:armhf	1.25-2	armhf
GNU Libidn library, implementation of IETF IDN specifications			
ii	libidn11-dev	1.25-2	armhf
Development files for GNU Libidn, an IDN library			
ii	libjack-jackd2-0:armhf	1.9.8~dfsg.4+20120529git007cdc37-5	armhf
JACK Audio Connection Kit (libraries)			
ii	libjpeg8:armhf	8d-1+deb7u1	armhf
Independent JPEG Group's JPEG runtime library			

ii	libjson0:armhf	0.10-1.2	armhf
	JSON manipulation library - shared library		
ii	libk5crypto3:armhf	1.10.1+dfsg-5+deb7u2	armhf
	MIT Kerberos runtime libraries - Crypto Library		
ii	libkadm5clnt-mit8:armhf	1.10.1+dfsg-5+deb7u2	armhf
	MIT Kerberos runtime libraries - Administration Clients		
ii	libkadm5srv-mit8:armhf	1.10.1+dfsg-5+deb7u2	armhf
	MIT Kerberos runtime libraries - KDC and Admin Server		
ii	libkdb5-6:armhf	1.10.1+dfsg-5+deb7u2	armhf
	MIT Kerberos runtime libraries - Kerberos database		
ii	libkeyutils1:armhf	1.5.5-3	armhf
	Linux Key Management Utilities (library)		
ii	libklibc	2.0.1-3.1+rpil	armhf
	minimal libc subset for use with initramfs		
ii	libkmod2:armhf	9-3	armhf
	libkmod shared library		
ii	libkrb5-3:armhf	1.10.1+dfsg-5+deb7u2	armhf
	MIT Kerberos runtime libraries		
ii	libkrb5-dev	1.10.1+dfsg-5+deb7u2	armhf
	Headers and development libraries for MIT Kerberos		
ii	libkrb5support0:armhf	1.10.1+dfsg-5+deb7u2	armhf
	MIT Kerberos runtime libraries - Support library		
ii	libldap-2.4-2:armhf	2.4.31-1+nmu2	armhf
	OpenLDAP libraries		
ii	libldap2-dev:armhf	2.4.31-1+nmu2	armhf
	OpenLDAP development libraries		
ii	liblocale-gettext-perl	1.05-7	armhf
	module using libc functions for internationalization in Perl		
ii	libltdl7:armhf	2.4.2-1.1	armhf
	A system independent dlopen wrapper for GNU libtool		
ii	liblzma5:armhf	5.1.1alpha+20120614-2	armhf
	XZ-format compression library		
ii	liblzo2-2:armhf	2.06-1+deb7u1	armhf
	data compression library		
ii	libmad0	0.15.1b-7	armhf
	MPEG audio decoder library		
ii	libmagic1:armhf	5.11-2+deb7u3	armhf
	File type determination library using "magic" numbers		
ii	libmount1	2.20.1-5.3	armhf
	block device id library		
ii	libmp3lame0:armhf	3.99.5+repack1-3	armhf
	MP3 encoding library		
ii	libmpc2:armhf	0.9-4	armhf
	multiple precision complex floating-point library		
ii	libmpfr4:armhf	3.1.0-5	armhf
	multiple precision floating-point computation		
ii	libncurses5:armhf	5.9-10	armhf
	shared libraries for terminal handling		
ii	libncursesw5:armhf	5.9-10	armhf
	shared libraries for terminal handling (wide character support)		
ii	libnewt0.52	0.52.14-11.1	armhf

```
Not Erik's Windowing Toolkit - text mode windowing with slang
ii libnfnetwork0 1.0.0-1.1 armhf
Netfilter netlink library
ii libnih-dbus1 1.0.3-4.1 armhf
NIH D-Bus Bindings Library
ii libnih1 1.0.3-4.1 armhf
NIH Utility Library
ii libogg0:armhf 1.3.0-4 armhf
Ogg bitstream library
ii libopencore-amrnb0:armhf 0.1.3-2 armhf
Adaptive Multi Rate speech codec - shared library
ii libopencore-amrwb0:armhf 0.1.3-2 armhf
Adaptive Multi-Rate - Wideband speech codec - shared library
ii libopenjpeg2:armhf 1.3+dfsg-4.8 armhf
JPEG 2000 image compression/decompression library
ii liborc-0.4-0:armhf 1:0.4.16-2 armhf
Library of Optimized Inner Loops Runtime Compiler
ii libp11-kit-dev 0.12-3 armhf
Library for loading and coordinating access to PKCS#11 modules - development
ii libp11-kit0:armhf 0.12-3 armhf
Library for loading and coordinating access to PKCS#11 modules - runtime
ii libpam-modules:armhf 1.1.3-7.1 armhf
Pluggable Authentication Modules for PAM
ii libpam-modules-bin 1.1.3-7.1 armhf
Pluggable Authentication Modules for PAM - helper binaries
ii libpam-runtime 1.1.3-7.1 all
Runtime support for the PAM library
ii libpam0g:armhf 1.1.3-7.1 armhf
Pluggable Authentication Modules library
ii libpci3:armhf 1:3.1.9-6 armhf
Linux PCI Utilities (shared library)
ii libpci3:armhf 1:3.1.9-6 armhf
Perl 5 Compatible Regular Expression Library - runtime files
ii libpipeline1:armhf 1.2.1-1 armhf
pipeline manipulation library
ii libpng12-0:armhf 1.2.49-1 armhf
PNG library - runtime
ii libpopt0:armhf 1.16-7 armhf
lib for parsing cmdline parameters
ii libprocps0:armhf 1:3.3.3-3 armhf
library for accessing process information from /proc
ii libpulse0:armhf 2.0-6.1 armhf
PulseAudio client libraries
ii libpython3.2 3.2.3-7 armhf
Shared Python runtime library (version 3.2)
ii libreadline6:armhf 6.2+dfsg-0.1 armhf
GNU readline and history libraries, run-time libraries
ii librtmp-dev 2.4+20111222.git4e06e21-1 armhf
toolkit for RTMP streams (development files)
ii librtmp0:armhf 2.4+20111222.git4e06e21-1 armhf
toolkit for RTMP streams (shared library)
```

ii	libsamplerate0:armhf	0.1.8-5	armhf
	Audio sample rate conversion library		
ii	libsasl2-2:armhf	2.1.25.dfsg1-6+deb7u1	armhf
	Cyrus SASL - authentication abstraction library		
ii	libsasl2-modules:armhf	2.1.25.dfsg1-6+deb7u1	armhf
	Cyrus SASL - pluggable authentication modules		
ii	libschroedinger-1.0-0:armhf	1.0.11-2	armhf
	library for encoding/decoding of Dirac video streams		
ii	libselinux1:armhf	2.1.9-5	armhf
	SELinux runtime shared libraries		
ii	libsemanage-common	2.1.6-6	all
	Common files for SELinux policy management libraries		
ii	libsemanage1:armhf	2.1.6-6	armhf
	SELinux policy management library		
ii	libsepol1:armhf	2.1.4-3	armhf
	SELinux library for manipulating binary security policies		
ii	libsigc++-1.2-5c2	1.2.7-2+b1	armhf
	type-safe Signal Framework for C++ - runtime		
ii	libsigc++-2.0-0c2a:armhf	2.2.10-0.2	armhf
	type-safe Signal Framework for C++ - runtime		
ii	libslang2:armhf	2.2.4-15	armhf
	S-Lang programming library - runtime version		
ii	libsm6:armhf	2:1.2.1-2	armhf
	X11 Session Management library		
ii	libsndfile1:armhf	1.0.25-5	armhf
	Library for reading/writing audio files		
ii	libsox-fmt-all	14.4.0-3	armhf
	All SoX format libraries		
ii	libsox-fmt-alsa	14.4.0-3	armhf
	SoX alsa format I/O library		
ii	libsox-fmt-ao	14.4.0-3	armhf
	SoX Libao format I/O library		
ii	libsox-fmt-base	14.4.0-3	armhf
	Minimal set of SoX format libraries		
ii	libsox-fmt-ffmpeg	14.4.0-3	armhf
	SoX ffmpeg format library		
ii	libsox-fmt-mp3	14.4.0-3	armhf
	SoX MP2 and MP3 format library		
ii	libsox-fmt-oss	14.4.0-3	armhf
	SoX OSS format I/O library		
ii	libsox-fmt-pulse	14.4.0-3	armhf
	SoX PulseAudio format I/O library		
ii	libsox2	14.4.0-3	armhf
	SoX library of audio effects and processing		
ii	libspeex1:armhf	1.2~rc1-7	armhf
	The Speex codec runtime library		
ii	libspeexdsp1:armhf	1.2~rc1-7	armhf
	The Speex extended runtime library		
ii	libsqlite3-0:armhf	3.7.13-1+deb7u1	armhf
	SQLite 3 shared library		
ii	libss2:armhf	1.42.5-1.1	armhf

command-line interface parsing library		
ii	libssh2-1:armhf	1.4.2-1.1 armhf
SSH2 client-side library		
ii	libssh2-1-dev	1.4.2-1.1 armhf
SSH2 client-side library (development headers)		
ii	libssl-dev	1.0.1e-2+rvt+deb7u11 armhf
SSL development libraries, header files and documentation		
ii	libssl-doc	1.0.1e-2+rvt+deb7u11 all
SSL development documentation documentation		
ii	libssl1.0.0:armhf	1.0.1e-2+rvt+deb7u11 armhf
SSL shared libraries		
ii	libstdc++6:armhf	4.7.2-5+rpil armhf
GNU Standard C++ Library v3		
ii	libstdc++6-4.6-dev	4.6.3-14+rpil armhf
GNU Standard C++ Library v3 (development files)		
ii	libswitch-perl	2.16-2 all
switch statement for Perl		
ii	libsysfs2:armhf	2.1.0+repack-2 armhf
interface library to sysfs		
ii	libtagcoll2-dev	2.0.13-1.1 armhf
Functions used to manipulate tagged collections (development version)		
ii	libtasn1-3:armhf	2.13-2 armhf
Manage ASN.1 structures (runtime)		
ii	libtasn1-3-dev	2.13-2 armhf
Manage ASN.1 structures (development)		
ii	libtext-charwidth-perl	0.04-7 armhf
get display widths of characters on the terminal		
ii	libtext-iconv-perl	1.7-5 armhf
converts between character sets in Perl		
ii	libtext-wrapil8n-perl	0.06-7 all
internationalized substitute of Text::Wrap		
ii	libtheora0:armhf	1.1.1+dfsg.1-3.1 armhf
The Theora Video Compression Codec		
ii	libtimedate-perl	1.2000-1 all
collection of modules to manipulate date/time information		
ii	libtinfo5:armhf	5.9-10 armhf
shared low-level terminfo library for terminal handling		
ii	libtwolame0	0.3.13-1 armhf
MPEG Audio Layer 2 encoding library		
ii	libudev0:armhf	175-7.2 armhf
libudev shared library		
ii	libusb-0.1-4:armhf	2:0.1.12-20+nmul armhf
userspace USB programming library		
ii	libustr-1.0-1:armhf	1.0.4-3 armhf
Micro string library: shared library		
ii	libuuid1:armhf	2.20.1-5.3 armhf
Universally Unique ID library		
ii	libval:armhf	1.0.15-4 armhf
Video Acceleration (VA) API for Linux -- runtime		
ii	libvorbis0a:armhf	1.3.2-1.3 armhf
The Vorbis General Audio Compression Codec (Decoder library)		

ii	libvorbisenc2:armhf	1.3.2-1.3	armhf
	The Vorbis General Audio Compression Codec (Encoder library)		
ii	libvorbisfile3:armhf	1.3.2-1.3	armhf
	The Vorbis General Audio Compression Codec (High Level API)		
ii	libvpx1:armhf	1.1.0-1+rpil	armhf
	VP8 video codec (shared library)		
ii	libwavpack1:armhf	4.60.1-3	armhf
	audio codec (lossy and lossless) - library		
ii	libwibble-dev	0.1.28-1.1	armhf
	Library of various useful C++ code		
ii	libwrap0:armhf	7.6.q-24	armhf
	Wietse Venema's TCP wrappers library		
ii	libx11-6:armhf	2:1.5.0-1+deb7u1+wheezy	armhf
	X11 client-side library		
ii	libx11-data	2:1.5.0-1+deb7u1+wheezy	all
	X11 client-side library		
ii	libx11-xcb1:armhf	2:1.5.0-1+deb7u1+wheezy	armhf
	Xlib/XCB interface library		
ii	libx264-123:armhf	2:0.123.2189+git35cf912-1+rpil	armhf
	x264 video coding library		
ii	libxapian-dev	1.2.12-2	armhf
	Development files for Xapian search engine library		
ii	libxapian22	1.2.12-2	armhf
	Search engine library		
ii	libxau6:armhf	1:1.0.7-1	armhf
	X11 authorisation library		
ii	libxcb1:armhf	1.8.1-2+deb7u1	armhf
	X C Binding		
ii	libxdmcp6:armhf	1:1.1.1-1	armhf
	X11 Display Manager Control Protocol library		
ii	libxext6:armhf	2:1.3.1-2+deb7u1	armhf
	X11 miscellaneous extension library		
ii	libxi6:armhf	2:1.6.1-1+deb7u1	armhf
	X11 Input extension library		
ii	libxml2:armhf	2.8.0+dfsg1-7+wheezy1	armhf
	GNOME XML library		
ii	libxmuu1:armhf	2:1.1.1-1	armhf
	X11 miscellaneous micro-utility library		
ii	libxtst6:armhf	2:1.2.1-1+deb7u1	armhf
	X11 Testing -- Record extension library		
ii	libxvidcore4:armhf	2:1.3.2-9	armhf
	Open source MPEG-4 video codec (library)		
ii	linux-libc-dev:armhf	3.2.51-1+rpil	armhf
	Linux support headers for userspace development		
ii	login	1:4.1.5.1-1	armhf
	system login tools		
ii	logrotate	3.8.1-4	armhf
	Log rotation utility		
ii	lsb-base	4.1+Debian8+rpil+deb7u1	all
	Linux Standard Base 4.1 init script functionality		
ii	make	3.81-8.2	armhf

An utility for Directing compilation.

ii	makedev	2.3.1-92	all
creates device files in /dev			
ii	man-db	2.6.2-1	armhf
on-line manual pager			
ii	manpages	3.44-1	all
Manual pages about using a GNU/Linux system			
ii	mawk	1.3.3-17	armhf
a pattern scanning and text processing language			
ii	mime-support	3.52-1	all
MIME files 'mime.types' & 'mailcap', and support programs			
ii	minidlna	1.0.24+dfsg-1	armhf
lightweight DLNA/UPnP-AV server targeted at embedded systems			
ii	mount	2.20.1-5.3	armhf
Tools for mounting and manipulating filesystems			
ii	mountall	2.46	armhf
filesystem mounting tool			
ii	mtd-utils	1:1.5.0-1	armhf
Memory Technology Device Utilities			
ii	multiarch-support	2.13-38+rpi2+deb7u3	armhf
Transitional package to ensure multiarch compatibility			
ii	nano	2.2.6-1	armhf
small, friendly text editor inspired by Pico			
ii	ncurses-base	5.9-10	all
basic terminal type definitions			
ii	ncurses-bin	5.9-10	armhf
terminal-related programs and man pages			
ii	ncurses-term	5.9-10	all
additional terminal type definitions			
ii	net-tools	1.60-24.2	armhf
The NET-3 networking toolkit			
ii	netbase	5.0	all
Basic TCP/IP networking system			
ii	netcat-openbsd	1.105-7	armhf
TCP/IP swiss army knife			
ii	netcat-traditional	1.10-40	armhf
TCP/IP swiss army knife			
ii	openssh-blacklist	0.4.1+nmu1	all
list of default blacklisted OpenSSH RSA and DSA keys			
ii	openssh-blacklist-extra	0.4.1+nmu1	all
list of non-default blacklisted OpenSSH RSA and DSA keys			
ii	openssh-client	1:6.0p1-4+deb7u2	armhf
secure shell (SSH) client, for secure access to remote machines			
ii	openssh-server	1:6.0p1-4+deb7u2	armhf
secure shell (SSH) server, for secure access from remote machines			
ii	openssl	1.0.1e-2+rvt+deb7u11	armhf
Secure Socket Layer (SSL) binary and related cryptographic tools			
ii	passwd	1:4.1.5.1-1	armhf
change and administer password and group data			
ii	patch	2.6.1-3	armhf
Apply a diff file to an original			

ii pciutils	1:3.1.9-6	armhf
Linux PCI Utilities		
ii perl	5.14.2-21+rpi2+deb7u1	armhf
Larry Wall's Practical Extraction and Report Language		
ii perl-base	5.14.2-21+rpi2+deb7u1	armhf
minimal Perl system		
ii perl-modules	5.14.2-21+rpi2+deb7u1	all
Core Perl modules		
ii pkg-config	0.26-1	armhf
manage compile and link flags for libraries		
ii plymouth	0.8.5.1-5	armhf
Graphical Boot Animation and Logger		
ii procs	1:3.3.3-3	armhf
/proc file system utilities		
ii python3	3.2.3-6	all
interactive high-level object-oriented language (default python3 version)		
ii python3-decorator	3.3.3-1	all
simplify usage of Python decorators by programmers		
ii python3-dev	3.2.3-6	all
header files and a static library for Python (default)		
ii python3-minimal	3.2.3-6	all
minimal subset of the Python language (default python3 version)		
ii python3-pip	1.1-3	all
alternative Python package installer - Python 3 version of the package		
ii python3-pkg-resources	0.6.24-1	all
Package Discovery and Resource Access using pkg_resources		
ii python3-setuptools	0.6.24-1	all
Python3 Distutils Enhancements (setuptools compatibility)		
ii python3-simplegeneric	0.8.1-1	all
simple generic functions for Python3		
ii python3.2	3.2.3-7	armhf
Interactive high-level object-oriented language (version 3.2)		
ii python3.2-dev	3.2.3-7	armhf
Header files and a static library for Python (v3.2)		
ii python3.2-minimal	3.2.3-7	armhf
Minimal subset of the Python language (version 3.2)		
ii raspbian-archive-keyring	20120528.2	all
GnuPG archive keys of the raspbian archive		
ii readline-common	6.2+dfsg-0.1	all
GNU readline and history libraries, common files		
ii rsyslog	5.8.11-3	armhf
reliable system and kernel logging daemon		
ii sed	4.2.1-10	armhf
The GNU sed stream editor		
ii sensible-utils	0.0.7	all
Utilities for sensible alternative selection		
ii sgml-base	1.26+nmu4	all
SGML infrastructure and SGML catalog file support		
ii shared-mime-info	1.0-1	armhf
FreeDesktop.org shared MIME database and spec		
ii sox	14.4.0-3	armhf

Swiss army knife of sound processing		
ii	sudo	1.8.5p2-1+nmul armhf
Provide limited super user privileges to specific users		
ii	sysv-rc	2.88dsf-41+deb7u1 all
System-V-like runlevel change mechanism		
ii	sysvinit	2.88dsf-41+deb7u1 armhf
System-V-like init utilities		
ii	sysvinit-utils	2.88dsf-41+deb7u1 armhf
System-V-like utilities		
ii	tar	1.26+dfsg-0.1 armhf
GNU version of the tar archiving utility		
ii	tasksel	3.14.1 all
Tool for selecting tasks for installation on Debian systems		
ii	tasksel-data	3.14.1 all
Official tasks used for installation of Debian systems		
ii	tcpd	7.6.q-24 armhf
Wietse Venema's TCP wrapper utilities		
ii	traceroute	1:2.0.18-3 armhf
Traces the route taken by packets over an IPv4/IPv6 network		
ii	tzdata	2014e-0wheezy1 all
time zone and daylight-saving time data		
ii	udev	175-7.2 armhf
/dev/ and hotplug management daemon		
ii	util-linux	2.20.1-5.3 armhf
Miscellaneous system utilities		
ii	vim-common	2:7.3.547-7 armhf
Vi IMproved - Common files		
ii	vim-tiny	2:7.3.547-7 armhf
Vi IMproved - enhanced vi editor - compact version		
ii	wget	1.13.4-3+deb7u1 armhf
retrieves files from the web		
ii	whiptail	0.52.14-11.1 armhf
Displays user-friendly dialog boxes from shell scripts		
ii	x11-common	1:7.7+3~deb7u1 all
X Window System (X.Org) infrastructure		
ii	xauth	1:1.0.7-1 armhf
X authentication utility		
ii	xml-core	0.13+nmu2 all
XML infrastructure and XML catalog file support		
ii	xz-utils	5.1.1alpha+20120614-2 armhf
XZ-format compression utilities		
ii	zlibg:armhf	1:1.2.7.dfsg-13 armhf
compression library - runtime		
ii	zlibg-dev:armhf	1:1.2.7.dfsg-13 armhf
compression library - development		

1)

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