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August 16, 2008

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People Thanks Embedded Debian supports reducing Debian down to be suitable for much smaller systems whilst keeping the multiarchitecture support, vendor independence, social contract and huge software base.

Emdebian 1.0 will be based on Debian 5.0 "Lenny"

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- Emdebian 1.0 will be based on Debian 5.0 "Lenny"
- Lenny already contains the build tools for Emdebian which allow Debian source packages to be cross-built and shrunk to suit embedded ARM systems.

The Emdebian 1.0 distribution itself will contain prebuilt ARM packages sufficient to create root filesystems that can be customised for specific machines and machine variants. Kernels and kernel modules need to be provided separately. Support for armel and i386 is pending.

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- Full control of dependencies on small systems (some modified dependencies). Remove perl and remove or reimplement required perl scripts. Remove documentation.

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People Thanks Build = Big or builD == Desktop Host == Handheld

• Toolchains for installation on i386, amd64 build machines.

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- To build for arm, armel, ia64, m68k, mips, mipsel, powerpc and sparc host machines.

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- Using gcc-3.3, 3.4, 4.1, 4.2 and 4.3

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- dpkg-cross, apt-cross and emdebian-tools in Debian Lenny.

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- dpkg-cross, apt-cross and emdebian-tools in Debian Lenny.
- · Cross-building package autobuilder.

emdebian-tools

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People Thanks Set of Debian packages to make cross building Debian easier, includes apt-cross, dpkg-cross and emdebian-tools.

Installing toolchains.

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- Installing toolchains.
- Downloading and installing cross-architecture libraries and headers.

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People Thanks

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- Patching Debian source packages, implementing incremental improvements.

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People Thanks

- Installing toolchains.
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- Cross building binary packages with support for machine:variant customisation patches.

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- Reporting bugs to Debian with patches for crossbuild support.
- Cross building binary packages with support for machine:variant customisation patches.
- Generating customised root filesystems from binary packages.

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- Busybox based root filesystem.
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- Busybox based root filesystem.
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- Cross-building autobuilder support in emdebian-tools. http://www.emdebian.org/buildd/

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- Support for creating filesystem images that need only minimal configuration on the embedded device.

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- Machine:variant customisation support including package selection, custom packages, custom configurations and integration with kernels and modules.

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- Machine:variant customisation support including package selection, custom packages, custom configurations and integration with kernels and modules.
- Current focus is on GPE, with more developer time any other environment could be made available.

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 Current method uses debootstrap, other backends are possible.

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Customising for specific machine variants

- Current method uses debootstrap, other backends are possible.
- (Second stage of normal debootstrap requires a working cross compiler to work without perl.)

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Customising for specific machine variants

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- 'Unpack' method in development to create a filesystem image without .deb files. Only needs minor configuration on the device.

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filesystems

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- '-machine foo' for general changes (default variant)

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Root filesystems

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filesystems

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- '-machine foo' '-variant code' for other derivations.
- Customised package selection with no fixed package sets select anything that works.
- Example full GPE GUI filesystem 25Mb compressed, about 75Mb installed. (Work is ongoing to drop below 64Mb installed.)

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People Thanks Embedded devices need customised kernels and kernel modules.

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- Embedded devices need customised kernels and kernel modules.
- Installation methods are often specific to that device or device type and might not fit with typical D-I setup.

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- Embedded devices need customised kernels and kernel modules.
- Installation methods are often specific to that device or device type and might not fit with typical D-I setup.
- Emdebian is investigating D-I support with a pre-built root filesystem tarball - just needs to be unpacked and run # dpkg -configure -a

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- Installation methods are often specific to that device or device type and might not fit with typical D-I setup.
- Emdebian is investigating D-I support with a pre-built root filesystem tarball - just needs to be unpacked and run # dpkg -configure -a
- Example: (balloon3)
 boot flash (bootloader support on RO partition)
 mount USB stick and the root partition.
 Copy over the kernel image.
 Untar the root filesystem directly onto the root partition chroot into root filesystem, dpkg –configure -a untar kernel modules

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- Dependencies will differ.
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- Dependencies will differ.
- Bandwidth considerations much larger packages.
- translations causing conflicts (until TDebs in Debian)

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- Dependencies will differ.
- Bandwidth considerations much larger packages.
- translations causing conflicts (until TDebs in Debian)
- Library transitions.

Things to improve in Emdebian

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Toolchain build times.

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- Toolchain build times.
- glibc & tzdata size reductions.

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- Toolchain build times.
- glibc & tzdata size reductions.
- armel support.
- Code Audit.

Toolchain build times.

glibc & tzdata size reductions.

armel support.

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Python support (for OpenMoko).

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Toolchain build times.

glibc & tzdata size reductions.

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 Debian-Installer Integration - passing the prepared root filesystem to D-I to reduce the amount of work needed by the device.

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Toolchain build times.

glibc & tzdata size reductions.

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i386 support

Things to improve in Emdebian

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- Python support (for OpenMoko).
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- NMU's of old cross-building bugs.
- i386 support
- Checkpointing support in YAFFS

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People Thanks \$ sudo apt-get install emdebian-tools subversion

\$ emsetup -a arm -v -s

\$ emsetup -a arm -v

\$ emsource libgpewidget1

\$ cd /\$work/trunk/I/libgpewidget/trunk/libgpewidget-0.115/

\$ emdebuild -a arm -v

\$ emrecent

or:

\$ embug - - prepare

\$ cd ../../branches/embugG2342/

\$ meld libgpewidget.debian/debian/rules

libgpewidget.emdebian/debian/rules

\$ reportbug -M -b -i ../crossbuild.diff libgpewidget

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- matchbox provides window manager, as in Familiar or OpenEmbedded.
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- GPE provides a calendar, addressbook, todo, expenses, configuration tools, games, console, calculator, image viewer and text editor.
- Support for stylus input and touchscreen control on suitable devices.
- Bluetooth and audio support included if suitable hardware is present.

Thanks

http://www.toby-churchill.com/ http://www.emdebian.org/ Many individuals: Wookey, Hector Oron, Neil Williams, Jonathan McDowell, Peter De Schrijver (p2), Nikita Y. Youshchenko, Phil Hands, Simon Richter, Phillipe de Swert, Raphael Bossek, Allen Curtis and anyone I might have forgotten.