

Creating Custom Debian Live for USB FD with Encrypted Persistence

INTRO

Debian is a free operating system (OS) for your computer. An operating system is the set of basic programs and utilities that make your computer run.

Debian provides more than a pure OS: it comes with over 43000 packages, precompiled software bundled up in a nice format for easy installation on your machine.

PRE-REQ

- * Debian distro installed
- * Free Disk Space (Depends on you) Recommended Free Space >20GB
- * Internet Connection Fast
- * USB Flash Drive atleast 4GB

Installing Required Softwares on your distro:

Open **Root** Terminal or use sudo:

```
$ sudo apt-get install debootstrap syslinux squashfs-tools genisoimage memtest86+  
rsync apt-cacher-ng live-build live-config live-boot live-boot-doc live-config-doc  
live-manual live-tools live-manual-pdf qemu-kvm qemu-utils virtualbox virtualbox-qt  
virtualbox-dkms p7zip-full gparted mbr dosfstools parted
```

Configuring APT Proxy Server (to save bandwidth)

Start apt-cacher-ng service if not running

```
# service apt-cacher-ng start
```

Edit /etc/apt/sources.list with your favorite text editor.

Terminal

```
# nano /etc/apt/sources.list
```

Output: (depends on your APT Mirror configuration)

```
deb http://security.debian.org/ jessie/updates main contrib non-free
```

```
deb http://http.debian.org/debian jessie main contrib non-free
```

```
deb http://ftp.debian.org/debian jessie main contrib non-free
```

Add "localhost:3142" :

```
deb http://localhost:3142/security.debian.org/ jessie/updates main contrib non-free
```

```
deb http://localhost:3142/http.debian.org/debian jessie main contrib non-free
```

```
deb http://localhost:3142/ftp.debian.org/debian jessie main contrib non-free
```

Press Ctrl + X and Y to save changes

Terminal

```
# apt-get update
```

```
# apt-get upgrade
```

NOTE: BUG in Debian Live.

WARNING: to use "--binary-images hdd", see this bug: <https://bugs.debian.org/cgi-bin/bugreport.cgi?bug=773833>

WARNING: to get persistence encryption working, apply this fix: <https://bugs.debian.org/cgi-bin/bugreport.cgi?bug=767195>

Fixing the Bugs on Debian Jessie:

1. BUGLIST FIX: orig: [github subaddiction/jessie.sh](#)

#767195 – cryptsetup needs to be enabled for initramfs inclusion – Debian Bug report logs

On Wed, Oct 29, 2014 @ 18:09, Evgeni Golov <evgeni@grml.org> wrote:

....

Edit: Line 77 -79 @

```
# nano /usr/lib/live/build/chroot_hacks
```

from:

```
if [ "${LB_INITRAMFS}" != "none" ]
```

then

```
Chroot chroot "${UPDATE_INITRAMFS_OPTIONS} update-initramfs -k all -t -u"
```

```
fi
```

to:

```
if [ "${LB_INITRAMFS}" != "none" ]
```

then

```
Chroot chroot "${UPDATE_INITRAMFS_OPTIONS} CRYPTSETUP=y update-initramfs -k all -t -u"
```

```
fi
```

2. BUGLIST #773833 – syslinux mbr.bin file not found

From: chals <chals@chalsattack.com>

Date: Wed, 24 Dec 2014 18:14:41 +0100

edit: Line 191

```
# nano /usr/lib/live/build/binary_hdd
```

From:

```
if [ "${LB_BOOTLOADER}" = "syslinux" ]
```

then

```
dd if=chroot/usr/lib/${_BOOTLOADER}/mbr.bin of=${FREELO} bs=440 count=1
```

```
fi
```

```
::
```

To:

```
if [ "${LB_BOOTLOADER}" = "syslinux" ]
```

then

```
dd if=chroot/usr/lib/SYSLINUX/mbr.bin of=${FREELO} bs=440 count=1
```

```
fi
```

```
::
```

Create Debian Live directories.

Terminal

```
$ mkdir ~/debian-live
```

```
$ cd ~/debian-live
```

```
$ mkdir mylive && cd mylive && lb config
```

```
$ mkdir auto
```

```
$ cp /usr/share/doc/live-build/examples/auto/* auto/
```

Edit auto/config:
\$ nano auto/config

OUTPUT:

```
#!/bin/sh

set -e

lb config noauto \
  --architectures i386 \ #Change to i686 if you want x64 OS
  --linux-flavours 686-pae \ #can support >4GB RAM on 32 bit OS
  --binary-images hdd \ #for USB Flash Drive or External HDD
  --distribution jessie \ #Distro version
  --debconf-frontend dialog \
  --archive-areas "main contrib non-free" \ #apt archives
  --apt apt \ #package manager
  --cache true \ #cache packages to save bandwidth
  --cache-packages true \
  --bootstrap debootstrap \
  --debian-installer false \ #does not include debian installer
  --memtest memtest86+ \
  --apt-recommends false \ #disable apt recommends to save disk space
  --mirror-binary http://localhost:3142/ftp.jp.debian.org/debian \
  --mirror-binary-security http://localhost:3142/security.debian.org \
  --mirror-bootstrap http://localhost:3142/ftp.jp.debian.org/debian \
  --mirror-chroot http://localhost:3142/ftp.jp.debian.org/debian \
  --mirror-chroot-security http://localhost:3142/security.debian.org \
  --cache-indices enabled \
  --bootappend-live "boot=live config components persistence
persistence-encryption=luks,none username=user hostname=debianlive
locales=en_PH.UTF-8" \ #change locales to your preferred
  "${@}"
```

Add your packages (Create a bash script):

\$ nano packages.sh

Add:

```
#!/bin/bash
```

```
# Essentials
```

```
echo "cryptsetup user-setup live-tools live-build live-config" > config/package-  
lists/essential.list.chroot
```

```
# Desktop Manager change to GNOME or KDE or MATE or LXDE or XFCE
```

```
echo task-lxde-desktop > config/package-lists/desktop.list.chroot
```

```
# Internet
```

```
echo "iceweasel chromium icedove transmission wget curl filezilla linphone pidgin  
pidgin-otr network-manager network-manager-gnome" > config/package-  
lists/internet.list.chroot
```

```
# OFFICE
```

```
echo "libreoffice" > config/package-lists/office.list.chroot
```

UTILITIES

```
echo "vim byobu nmap netcat htop ssh-client gnupg2 seahorse gedit-plugins gnome-disk-utility gparted python leafpad mousepad gedit" > config/package-lists/utils.list.chroot
```

GRAPHICS TOOLS

```
echo "inkscape python-libxml2 python-numpy blender gimp gimp-gap gimp-plugin-registry imagemagick create-resources" > config/package-lists/graphics.list.chroot
```

AUDIO/VIDEO

```
echo "libav-tools vlc mplayer smplayer openshot kdenlive pitivi jackd qjackctl puredata gem chuck" config/package-lists/audiovideo.list.chroot
```

MORE DEVELOPMENT/PROGRAMMING/SCRIPTING TOOLS

```
echo "build-essential node node-uglify php5-cli php5-sqlite php5-mcrypt racket" > config/package-lists/development.list.chroot
```

MORE ENCRYPTION TOOLS

```
echo "iptables-persistent tor tor-geoipdb tor-arm torbrowser-launcher macchanger" > config/package-lists/privacy.list.chroot
```

#GAMES/EDUCATION

```
echo "steam dosbox gbrainy supertux tuxtype tuxpaint" > config/package-lists/games.list.chroot
```

Executing the script:

Terminal

```
$ ./packagess.sh
```

Building the Image

```
$ lb config
```

```
# lb build
```

OUTPUT:

```
[2015-12-02 18:58:50] lb build noauto
P: live-build 4.0.3
P: Building config tree for a debian/jessie/i386 system
[2015-12-02 18:58:50] lb bootstrap
P: Setting up cleanup function
[2015-12-02 18:58:50] lb bootstrap_cache restore
P: Restoring bootstrap stage from cache...
[2015-12-02 18:58:50] lb bootstrap_cdebootstrap
[2015-12-02 18:58:51] lb bootstrap_debootstrap
P: Begin bootstrapping system...
P: If the following stage fails, the most likely cause of the problem is with your mirror configuration or a caching proxy.
P: Running debootstrap (download-only)...
I: Retrieving Release
I: Retrieving Release.gpg
I: Checking Release signature
I: Valid Release signature (key id 75DDC3C4A499F1A18CB5F3C8CBF8D6FD518E17E1)
I: Retrieving Packages
I: Validating Packages
I: Retrieving Packages
I: Validating Packages
I: Retrieving Packages
I: Validating Packages
I: Retrieving Packages
I: Validating Packages
I: Resolving dependencies of required packages...
```

```

I: Resolving dependencies of base packages...
I: Found additional required dependencies: acl adduser dmsetup insserv libaudit-common
libaudit1 libbz2-1.0 libcap2 libcap2-bin libcryptsetup4 libdb5.3 libdebconfclient0
libdevmapper1.02.1 libgcrypt20 libgpg-error0 libkmod2 libncursesw5 libprocps3 libsemanage-
common libsemanage1 libslang2 libsystemd0 libudev1 libustr-1.0-1 procps systemd systemd-sysv
udev
I: Found additional base dependencies: libdns-export100 libffi6 libgmp10 libgnutls-deb0-28
libgnutls-openssl27 libhogweed2 libicu52 libidn11 libirs-export91 libisc-export95 libiscfg-
export90 libmnl0 libnetfilter-acct1 libnettle4 libnfnetwork0 libp11-kit0 libpsl0 libtasn1-6
I: Checking component main on http://localhost:3142/ftp.jp.debian.org/debian...
I: Retrieving acl 2.2.52-2
I: Validating acl 2.2.52-2
I: Retrieving libacl1 2.2.52-2
I: Validating libacl1 2.2.52-2
I: Retrieving adduser 3.113+nmu3
I: Validating adduser 3.113+nmu3
I: Retrieving apt 1.0.9.8.1
I: Validating apt 1.0.9.8.1
I: Retrieving apt-utils 1.0.9.8.1
I: Validating apt-utils 1.0.9.8.1
I: Retrieving libapt-inst1.5 1.0.9.8.1
I: Validating libapt-inst1.5 1.0.9.8.1
. . .

P: Deconfiguring file /bin/hostname
[2015-12-02 19:37:07] lb chroot_resolv remove
P: Deconfiguring file /etc/resolv.conf
[2015-12-02 19:37:07] lb chroot_hosts remove
P: Deconfiguring file /etc/hosts
[2015-12-02 19:37:08] lb chroot_upstart remove
[2015-12-02 19:37:08] lb chroot_sysv-rc remove
P: Deconfiguring file /usr/sbin/policy-rc.d
[2015-12-02 19:37:08] lb chroot_dpkg remove
P: Deconfiguring file /sbin/start-stop-daemon
[2015-12-02 19:37:08] lb chroot_debianchroot remove
P: Deconfiguring file /etc/debian_chroot
[2015-12-02 19:37:09] lb chroot_sysfs remove
P: Begin unmounting /sys...
[2015-12-02 19:37:09] lb chroot_selinuxfs remove
P: Begin unmounting /sys/fs/selinux...
[2015-12-02 19:37:09] lb chroot_proc remove
P: Begin unmounting /proc...
[2015-12-02 19:37:09] lb chroot_devpts remove
P: Begin unmounting /dev/pts...
P: Begin unmounting filesystems...
P: Saving caches...
Reading package lists...
Building dependency tree...
Reading state information...
[2015-12-02 19:37:11] lb source
$

```

```

user@debian:~$ ls -l
total 233876
drwxr-xr-x  2 user user      4096 Dec  2 18:56 auto
drwxr-xr-x  5 root root      4096 Dec  2 19:36 binary #binary output you can copy it to FD
-rw-r--r--  1 root root    173796 Dec  2 19:37 build.log #log file useful for finding
problems
drwxr-xr-x  7 root root      4096 Dec  2 19:21 cache
drwxr-xr-x 21 root root      4096 Dec  2 19:37 chroot #you can chroot to this folder to
modify the squashfs and also generate new squashfs image
-rw-r--r--  1 root root    1022072 Dec  2 19:22 chroot.files
-rw-r--r--  1 root root      4953 Dec  2 19:21 chroot.packages.install
-rw-r--r--  1 root root      4953 Dec  2 19:22 chroot.packages.live
drwxr-xr-x 18 user user      4096 Dec  2 18:58 config
-rw-r--r--  1 root root 241172480 Dec  2 19:36 live-image-i386 #this is our image to be

```

burned on a flash drive

```
-rw-r--r-- 1 root root      455 Dec  2 19:36 live-image-i386.contents
-rw-r--r-- 1 root root 1022072 Dec  2 19:33 live-image-i386.files
-rw-r--r-- 1 root root    4953 Dec  2 19:33 live-image-i386.packages
drwxr-xr-x 3 root root    4096 Dec  2 18:58 local
user@debian:~$
```

METHOD 2 Generate a small live image and chroot to install programs

Copy again the defaults:

```
edit auto/config
$ nano auto/config
```

Add:

```
#!/bin/sh
```

```
set -e
```

```
lb config noauto \
  --architectures i386 \
  --linux-flavours 686-pae \
  --binary-images hdd \
  --distribution jessie \
  --debconf-frontend dialog \
  --archive-areas "main contrib non-free" \
  --apt apt \
  --cache true \
  --cache-packages true \
  --bootstrap debootstrap \
  --mode debian \
  --system live \
  --memtest memtest86+ \
  --apt-recommends false \
  --mirror-binary http://localhost:3142/ftp.jp.debian.org/debian \
  --mirror-binary-security http://localhost:3142/security.debian.org \
  --mirror-bootstrap http://localhost:3142/ftp.jp.debian.org/debian \
  --mirror-chroot http://localhost:3142/ftp.jp.debian.org/debian \
  --mirror-chroot-security http://localhost:3142/security.debian.org \
  --cache-indices enabled \
  --bootappend-live "boot=live persistent config persistent=cryptsetup components
persistence persistence-encryption=luks,none username=user hostname=debianlive
locales=en_PH.UTF-8" \
  "${@}"
```

Edit config/package-list/

Add:

```
live-boot
live-config
live-config-systemd
user-setup
cryptsetup
task-lxde-desktop #minimal desktop packages
```

BUILD THE IMAGE

```
$ lb config
# lb build
```

Chroot to chroot

```
$ for i in /sys /proc /run /dev; do sudo mount --bind "$i" "./chroot$i"; done
$ sudo chroot ./chroot
```

OUTPUT:

```
root@debian:/# apt-get install <packagenames>
root@debian:/# echo do your customizations here
```

echo ADD USER:

```
root@debian:/# useradd -d /home/<username> -s /bin/bash -c "FULLNAME" <username>
root@debian:/# mkdir /home/<username> && chown <username> /home/<username> && passwd
<username>
```

ENTER UNIX PASSWORD:

VERIFY UNIX PASSWORD:

...tokens updated...

```
# dpkg --reconfigure tzdata #to change UTC to LOCAL TIME
```

```
root@debian:/# echo Exit chroot
```

```
root@debian:/# exit
```

OUT OF CHROOT ENV

```
user@debian:~/$ sudo umount -lf ./chroot/dev/pts
```

```
user@debian:~/$ sudo umount -lf ./chroot/dev
```

```
user@debian:~/$ sudo umount -lf ./chroot/run
```

```
user@debian:~/$ sudo umount -lf ./chroot/proc
```

```
user@debian:~/$ sudo umount -lf ./chroot/sys
```

```
user@debian:~/$ sudo mksquashfs chroot filesystem.squashfs -e boot
```

Copy the filesystem.squashfs to your USB Flash drive. Replace the original filesystem.squashfs.

WARNING: THE FOLLOWING STEPS WILL ERASE CONTENTS OF YOUR USB FLASH DRIVE PLEASE BACKUP DATA BEFORE EXECUTING ANY OF THE COMMANDS BELOW!

```
# fdisk -l #find your USB FD Device address /dev/sdX
```

OUTPUT:

```
Disk /dev/sdc: 4.0 GiB, 4009657472 bytes, 7927456 sectors
```

```
Units: sectors of 1 * 512 = 512 bytes
```

```
Sector size (logical/physical): 512 bytes / 512 bytes
```

```
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disklabel type: dos
```

```
Disk identifier: 0x4d9f9683
```

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdc1	*	2048	3985407	4983360	4.0G	b W95	FAT32

```
# parted /dev/sdc
```

SAMPLE OUTPUT: (Create 2 partitions using your favorite partitioning program)

```
$ sudo parted /dev/sdc
```

```
GNU Parted 3.2
```

```
Using /dev/sdc
```

```
Welcome to GNU Parted! Type 'help' to view a list of commands.
```

```
(parted) p
```

```
Model: NAME USB Drive (scsi)
```

```
Disk /dev/sdc: 4096MB
```

```
Sector size (logical/physical): 512B/512B
```

```
Partition Table: msdos
```

```
Disk Flags:
```

Number	Start	End	Size	Type	File system	Flags
1	1049kB	2041MB	4096MB	primary	fat32	---

```
(parted) mkpart primary fat32 1 1024M
(parted) mkpart primary ext4 1024M 1G
(parted) set 1 boot on
(parted) quit
# mkdosfs -n DEBIAN_LIVE /dev/sdc1
# mount /dev/sdc1 /mnt
# cp -rv binary/* /mnt
# umount /mnt
# cryptsetup luksFormat /dev/sdc2
# cryptsetup luksOpen /dev/sdc2 persistence
# mkfs.ext2 -L persistence /dev/mapper/persistence
# mount /dev/mapper/persistence /mnt
# nano persistence.conf
add: / union
# chown user persistence.conf
# umount /mnt
# cryptsetup luksClose persistence

# dd conv=notrunc bs=440 count=1 if=/usr/lib/syslinux/mbr/mbr.bin of=/dev/sdX
# parted /dev/sdX set 1 boot on

# syslinux -i /dev/sdX
```

ENJOY

GR01D

12 3 15

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