

Freevo From Scratch Building Guide

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This document describes the steps that are required to build Freevo from Scratch. Freevo is a Personal Video Recorder (PVR).

The primary goal of this project is to build a PVR that can be used by people with hearing difficulties so that subtitles are recorded along with the television programs. When a program is played back the recorded subtitles are displayed along with the program. The from scratch in the title means that all the software used to build this system is royalty free and has been built from source code.

While the primary goal of Freevo From Scratch is for people with hearing difficulties the information in this document is much more general and applies to any Freevo installation.

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1 Introduction

PVR from scratch is a project to build a Personal Video Recorder (PVR) using open source software and easily obtainable hardware. The hardware is build from personal computer components, the operating system is Linux and the PVR software is Python programs. Python in a scripting language that runs on various platforms including Microsoft Window, Mac OsX and Linux.

2 Hardware

The hardware that has been selected has to meet several criteria. It must be small and attractive enough to resemble a set-top box, it must be quiet and all the drivers for the components must be supported by Linux. The system chosen is a barebones system from Shuttle, the system components were selected for quality and a reasonable price. Cheaper component could have been used and it may have been possible to save 10% of the total cost. The hardware components are:

3 Freevo Packages

In the next sections is a list of packages and their links.

3.1 Freevo Required

The following are packages required for freevo to run on an X-window, which in turn is required for the TV-out of the PVR-350 TV card. This list is represented as a tree of dependencies, and the build order is generally important.

- <http://www.python.org/download/releases/>
 - <http://www.tcl.tk/software/tcltk/downloadnow84.tml>
 - * <http://www.tcl.tk/software/tcltk/downloadnow84.tml>
 - * <ftp://ftp.x.org/pub/X11R7.1/src/> or <ftp://ftp.x.org/pub/X11R6.9.0/src/>
 - <http://pkgconfig.freedesktop.org/releases/>
 - <http://expat.sourceforge.net/>
- <http://sourceforge.net/projects/mmpython>

- <http://www.pythonware.com/products/pil/>
- <http://pyxml.sourceforge.net/>
- <http://www.pygame.org/download.shtml>
 - <http://www.libsdl.org/release/>
 - http://www.libsdl.org/projects/SDL_ttf/release/
 - http://www.libsdl.org/projects/SDL_image/
 - * <http://libtiff.maptools.org/dl/>
 - <http://www.ijg.org/files/>
 - http://www.libsdl.org/projects/SDL_mixer/
 - * or <http://www.icculus.org/smpeg/>
 - <http://gd.tuwien.ac.at/graphics/gimp/gtk/v1.2>
 - <http://gd.tuwien.ac.at/graphics/gimp/gtk/v1.2/> (+)
 - <http://numpy.scipy.org/>
 - http://www.libsdl.org/projects/SDL_net/ (not required)
- <http://www.twistedmatrix.com/>
 - <http://zope.org/Products/ZopeInterface/>
 - <http://twistedmatrix.com/trac/>

3.2 Freevo Recommended

3.2.1 Reading DVDs

- <http://sourceforge.net/projects/lsdvd>
 - <http://www.dtek.chalmers.se/groups/dvd/dist>
 - * <http://download.videolan.org/pub/libdvdcss/>

3.2.2 freevo cache

- <http://initd.org/tracker/pysqlite>
 - <http://www.sqlite.org/>

3.2.3 freevo lirc plugin

- <http://pylirc.mccabe.nu/>
 - <http://www.lirc.org/software.html>

- `/etc/rc.d/init.d/lircd`

```
#!/bin/sh
#####
# Begin $rc_base/init.d/lircd
#
# Description :
#
# Authors   :
#
# Version   : 00.00
#
# Notes     :
#
#####
. /etc/sysconfig/rc
. ${rc_functions}
. /etc/sysconfig/lircd
case "${1}" in
    start)
        boot_mesg "Starting Lirc daemon..."
        if [ -c ${LIRC_DEVICE} ]; then
            loadproc /usr/sbin/lircd --device=${LIRC_DEVICE}
        else
            echo_failure
        fi
        ;;
    stop)
        boot_mesg "Stopping Lirc daemon..."
        killproc /usr/sbin/lircd
        ;;
    reload)
        boot_mesg "Reloading Lirc daemon..."
        reloadproc /usr/sbin/lircd
        ;;
    restart)
        ${0} stop
        sleep 1
        ${0} start
        ;;
    status)
        statusproc /usr/sbin/lircd
        ;;
    *)
        echo "Usage: ${0} {start|stop|reload|restart|status}"
        exit 1
        ;;
esac
# End $rc_base/init.d/lircd
```

- `/etc/sysconfig/freevo`

```
# Begin /etc/sysconfig/freevo
export LIRC_DEVICE=/dev/lirc0
# End /etc/sysconfig/freevo
```

3.3 freevo media players

The main two media players for freevo are mplayer and xine. Below is a list of dependencies which are mostly optional and installing them gives additional functionality to the players. The dependencies should really be represented as a network rather than a tree.

- <http://xinehq.de/index.php/download>
 - <http://xinehq.de/index.php/download>
 - * <http://www.theora.org/download.html>
 - <http://downloads.xiph.org/releases/vorbis/>
 - <http://downloads.xiph.org/releases/ogg/> (+)
 - * [svncohttp://www.libstk.net/svn/pub/libstk/trunk/libstk](http://www.libstk.net/svn/pub/libstk/trunk/libstk)
 - <http://www.boost.org/>
 - <http://www.linuxprinting.org/ijs/>
 - * <http://pulseaudio.org/>
 - * <http://prdownloads.sourceforge.net/libmng/>
 - <http://www.littlecms.com/>
 - * <http://prdownloads.sourceforge.net/fame/>
 - * <http://zapping.sourceforge.net/Zapping/>
 - <http://prdownloads.sourceforge.net/zapping/>
 - <http://www.68k.org/~michael/audiofile/>
 - <http://curl.haxx.se/download/>
 - * <http://www.openssl.org/source/>
 - * <http://josefsson.org/libidn/releases/>
 - <http://sourceforge.net/projects/aa-project> **ASCII art library**
 - * <http://gd.tuwien.ac.at/editors/davis/slang/v2.0/>
 - <http://libpng.sourceforge.net/>
 - <http://sam.zoy.org/libcaca/> **Colour ASCII art library**
 - * <http://prdownloads.sourceforge.net/enlightenment/>
 - <http://sourceforge.net/projects/mad>
 - * <http://ftp.gnome.org/pub/gnome/sources/imlib/1.9/>
 - <http://sourceforge.net/projects/libungif>
 - <http://www.directfb.org/>
 - <http://www.directfb.org/>
 - * <http://www.directfb.org/>

- * <http://sourceforge.net/projects/mad/>
- * <http://libcddb.sourceforge.net/download.html>
 - <http://www.gnu.org/software/libcdio/> **Optional**
 - <http://www.xiph.org/paranoia/download/> **(+)**
 - <http://www.gnu.org/software/libcdio/> **Optional (+)**
 - <http://www.vcdimager.org/pub/vcdimager/> **Optional (+)**
 - <http://www.gnu.org/software/libcdio/> **Required (++)**
- <http://flac.sourceforge.net/>
 - * <http://www.xmms.org/download.php>
 - <http://mikmod.raphnet.net/#files>
- <http://www.speex.org/downloads/>
- <ftp://ftp.imagemagick.org/pub/ImageMagick>
 - * <http://ftp.easysw.com/pub/ghostscript/>
 - <http://ghostscript.com/~giles/jbig2/jbig2dec/>
 - * <http://www.cl.cam.ac.uk/~mgk25/download/>
 - * <ftp://ftp.easysw.com/pub/cups/>
 - <http://packages.debian.org/unstable/source/libpaper/> **cp /usr/share/libtool/c**
 - * <http://heanet.dl.sourceforge.net/sourceforge/hplip/> **or** <http://hplip.sourceforge.net/>
 - <http://net-snmp.sourceforge.net/> **Optional**
- <http://corefonts.sourceforge.net/>
- <http://www.mplayerhq.hu/design7/dload.html>
 - <http://developers.videolan.org/libdca.html> **libdts-0.0.2**
 - <http://www.xvid.org/downloads.html>
 - <http://twolame.sourceforge.net/>
 - * <http://www.mega-nerd.com/libsndfile/>
 - <http://sourceforge.net/projects/faac/>
 - <http://dl.matroska.org/downloads/libmatroska/>
 - * <http://dl.matroska.org/downloads/libebml/>
- <http://www.bunkus.org/videotools/mkvtoolnix/source.html>
 - <http://www.oberhumer.com/opensource/lzo/download/> **or** <http://www.oberhumer.com/opensource/lzo/download/LZO-v1/>
- <http://svn.mplayerhq.hu/ffmpeg/trunk/>

- <http://sourceforge.net/projects/libdc1394/> or <http://damien.douxchamps.net/ieee1394/libdc1394/>
 - * <http://www.linux1394.org/>
- <http://developers.videolan.org/x264.html>
 - <http://gpac.sourceforge.net/>
 - * <http://sourceforge.net/projects/wxwindows>
 - * http://wiki.gnutelephony.org/index.php/Download_Page **libgsm**
 - * <ftp://ftp.gnome.org/pub/gnome/sources/gdk-pixbuf>
- <http://download.videolan.org/pub/vlc/>
 - <http://ffmpeg.mplayerhq.hu/download.html>
 - * <http://www.audiocoding.com/modules/mydownloads/>
 - * <http://www.audiocoding.com/modules/mydownloads/>
 - <http://mpeg4ip.sourceforge.net/downloads/index.php>
 - <http://libmpeg2.sourceforge.net/downloads.html>
 - <http://daap.sourceforge.net/>
 - <http://download.videolan.org/pub/libdvbpsi/>
 - <http://www.openslp.org/>
 - <http://people.freedesktop.org/~david/dist/>
 - * <http://www.freedesktop.org/wiki/Software/dbus/>
- <http://ftp.gnome.org/pub/gnome/sources/gtk+/>
 - <http://cairographics.org/releases/>
 - <http://ftp.gnome.org/pub/gnome/sources/pango/>
 - * <http://ftp.gnome.org/pub/gnome/sources/glib/>
 - <http://ftp.gnome.org/pub/gnome/sources/atk/>

3.4 freevo subtitle recording

- <http://www.linuxowl.com/software/>

3.5 freevo plugins

3.5.1 coversearch

- `~/.amazonkey`

3.6 freevo fonts

Not all of these fonts are required

3.6.1 /usr/share/fonts/truetype/

The following are fonts used by freevo and friends.

```
arialbd.ttf
Arial_Bold.ttf
arial.ttf
myriad.ttf
Myriad-Web.ttf
subfont.ttf (linked to myriad.ttf)
Vera.ttf
```

3.6.2 /usr/share/fonts/tv

The following are not really used by freevo but are used by tvtime, alevt and vbishow.

```
captioni.pcf.gz
caption.pcf.gz
led-iso10646-1.pcf.gz
led-iso8859-10.pcf.gz
led-iso8859-13.pcf.gz
led-iso8859-14.pcf.gz
led-iso8859-15.pcf.gz
led-iso8859-1.pcf.gz
led-iso8859-2.pcf.gz
led-iso8859-3.pcf.gz
led-iso8859-4.pcf.gz
led-iso8859-5.pcf.gz
led-iso8859-7.pcf.gz
led-iso8859-8.pcf.gz
led-iso8859-9.pcf.gz
led-koi8-r.pcf.gz
teletext1i.pcf.gz
teletext1.pcf.gz
teletext2i.pcf.gz
teletext2.pcf.gz
teletext4i.pcf.gz
teletext4.pcf.gz
vtxt.pcf
vtxtu.pcf
```

3.7 Remote access to data

- <ftp://ftp.samba.org/pub/samba/>
 - <http://rpm.net.in/mirror/rpm-4.4.x/>

3.8 Other Freevo Packages

- <http://www.jpj.net/~trevor/aumix.html> is required by freevo-1.5.4
- <http://libexif.sourceforge.net/> is required by freevo-1.5.4
- <http://jeremy.infogami.com/SetVFD> is required to drive the Shuttle Versatile Front-Panel Display (VFD)
 - <http://sourceforge.net/projects/pyusb/>
 - * <http://libusb.sourceforge.net/download.html>
- <http://www.linuxowl.com/software/>
- <http://www.linuxowl.com/software/>
- <http://www.linuxowl.com/software/>
- <http://www.linuxowl.com/software/>
- <http://acpid.sourceforge.net/>
- <http://www.lm-sensors.org/wiki/Download> is required to monitor temperatures
 - <http://linux-diag.sourceforge.net/Sysfsutils.html>
 - <http://people.ee.ethz.ch/~oetiker/webtools/rrdtool/pub/>
 - * http://ftp.gnome.org/pub/gnome/sources/libart_lgpl/
- <http://ftp.debian.org/debian/pool/main/n/newt/> is required by alsacnf (if alsacnf is needed)
- <http://ftp.debian.org/debian/pool/main/s/ssmtp/> is required to send mail messages for failures and vixie-cron-4.1
- <http://eject.sourceforge.net/> is required to eject a CD or DVD
- Geert's <http://users.telenet.be/geertu/Linux/fbdev/> is required to set the framebuffer mode

3.9 Freevo Plugins

See <http://freevo.sourceforge.net/addons/index.php>

- <http://repose.cx/pyosd/>
 - <http://www.ignavus.net/software.html>

<http://flatline.mine.nu/freevo-weather/>

freevo-mediaportal-theme-0.1

freevo-weather-mediaportal-iconset-0.1

freevo-dilbert-plugin-0.1

freevo-audio-albumtree-0.5.1

freevo-hddtemp-plugin-0.6

3.10 Other Useful Packages

- <http://subversion.tigris.org/downloads/subversion-1.4.0.tar.bz2>
 - <http://ftp.gnome.org/pub/gnome/sources/libxml2/2.6/>
 - <http://expat.sourceforge.net/>
- <ftp://ftp.openbios.org/pub/bootsplash/rpm-sources/bootsplash> allows a pretty boot screen
- <ftp://ftp.openbios.org/pub/bootsplash/kernel/> is required to use a boot splash screen (kernel patch)
- http://www.sno.phy.queensu.ca/~phil/exiftool/exiftool_pod.html is a tool to display information about media files

3.11 Documentation Tools

<http://sourceforge.net/projects/nasm>

<ftp://ftp.stack.nl/pub/doxygen>

- <http://jadetex.sourceforge.net/>
 - <http://heanet.dl.sourceforge.net/sourceforge/openjade/>
 - * <http://heanet.dl.sourceforge.net/sourceforge/openjade/>
 - <http://cyberelk.net/tim/data/xmlto/stable/>
- <http://cyberelk.net/tim/data/xmlto/stable/>
 - - * <ftp://xmlsoft.org/libxslt/>

- <http://heanet.dl.sourceforge.net/sourceforge/docbook/>
- * <http://www.docbook.org/xml/4.4/>
 - <ftp://ftp.info-zip.org/pub/infozip/src/>
- <http://sourceforge.net/projects/sgmltools-lite/>

4 Freevo Patches

5 Startup Scripts

When the machine is booted several processes need to be started.

The addition of the bootsplash screen meant that the rc files needed changing.

6 System Configuration

This is where the system configuration need to be up

7 ToDo