Rockbox – Free your Mp3 Player

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Who Am I?

- Linux Kernel Contributor (small crypto patches)
- IOCCC 2006 Winner – Most Obfuscated Sound
- Wage Slave at a marketing company in Omaha
- Board member of NEbraskaCERT

Questions and Caveats

- If you have any questions please ask
- I've only played with Rockbox on my Sansa C240 and my Iriver H10/20gb, so my experience with other player is what I've gotten from reading the wiki and the manuals

Disclaimer

If you start playing with the firmware of your Mp3 player. You may screw up your Mp3 player turning it into a small brick. I've had good luck with Rockbox and ended up with a couple of very functional free (libre) Mp3 players, your mileage may vary

What is Rockbox?

- Rockbox is an alternative firmware for various Mp3 players
- It currently runs on a variety of different players

How does Rockbox work?

- A lot of Mp3 players allow for upgradeable Firmware
- Which given the storage space available on modern Mp3 players gives enough room for an alternative firmware
- Funnily enough, many Mp3 players provide this so they can keep DRM working on their players

What Players does Rockbox Support

The following is an incomplete list

- Apple Ipods (1/2/3/4th gen), Color/Photo, Video, Nano (1st gen), Ipod Mini
- Iriver H10/H100/H320
- Archos (various)
- Cowan (various)
- Sandisk C2x0 (v1 only)/E2x0
- Toshiba Gigabeat F
- Others are in Development

My Player isn't supported will it be?

- If it is based on the PotalPlayer (SoC for Audio Devices) it has a good chance
- Work is still going on supporting the Telechip (SoC)
- If it is a newer device Nano 3rd gen, there is a good shot when more of it gets figured out
- If you want to work at supporting it :-)
- Hit the Rockbox Wiki for more details

Why Rockbox?

- You want to play Ogg/Speex/FLAC or other open formats
- You want/need voice enabled menus
- You want to play games on your Mp3 Player
- You want to run a free/open/libre (GPL v2) firmware on your Mp3 player
- You want to write an app/plugin for your player

Why Rockbox?

- Gapless playback of MP3s
- You speak a language not natively supported by your firmware
- Can usually run the original firmware as well
- It is uninstallable
- Its fun :-)

What Rockbox WON'T do for you

- Play DRM protected content
- Run on the latest/greatest player no 3rd gen nano, no ipod touch (yet)
- Play full motion video at 24fps on a 1st gen Ipod
- Do 100% of what the original firmware could do – Caveats
- No Divx yet

Caveats

Most players have some caveats

• Usually this is because of closed spec that prevents the original hardware from being accessed 100%
• Battery life might be as good as under the original firmware

Caveats Iriver H10/20Gb

- FM Radio doesn't work in the H10 20 Gb, is supposed to work in 5/6 Gb versions
- Slide control only works as simple up/down (patch is available for this, not in mainline yet)
- Alarm doesn't work, probably never will work due to design
- Microphone doesn't work (only worked in cradle anyway)

Sandisk E200/C200 Series

- Some of the later models e250s sometime leave screen artifacts on the LCD screen
- USB may not work for sync'ng music with device
  – Have to use MicroSD cards to get music onto system or boot into Original Firmware

Ipods

- Firewire doesn't work on most models
- Various issues depending on version of Ipod – can be as simple as doesn't do color correctly

What does Rockbox Look Like

• Let's fire up the UI Simulator to get a look at a couple of versions
• UI Simulator is used for writing manuals, trying out rockbox, verifying builds and developing/testing apps

• We'll fire up the Iriver version since that is my main player along with the Ipod Video Version

Quick note on Rockbox Versions

Four Major types of Rockbox Releases

- Release – very few of these have been done and they are WAY out of date
- Daily build – Build at the end of every day
- Current build – Automatically built after each SVN checkin
- Archived build – Daily builds are archived, sometimes falling back to one of them is a good idea

How to do an Install

There are two main ways to do an install

- Automatic (right way)
- Manual

Automatic Install

Use Rockbox Utility Program

http://download.rockbox.org/rbutil/

Note: there is an old WxWidgets based version
called rbutil and a QT based version called
RockboxUtilityQT. You want the QT based version

Lets Fire up the Rockbox Utility Program

Read the manual before you try and use the Rockbox Utility program

With the Iriver H10 player it currently doesn't rename the original firmware correctly, it should be OG.mi4 instead it renames it a longer name

Manual Install

Varies from Player to Player

On the Iriver H10 it is pretty simple

- Boot into Emergency USB mode
- Copy over the Rockbox directory structure
- Rename the original firmware to OG.mi4

What Rockbox Needs

- Klingon Fonts
- Klingon Translation
- More Themes
- A collection of default Open Content
- More publicity :-)
- Port to the Tatung m100 player

Fonts/Themes?

• Rockbox has various fonts available for it. I'm currently running the original ones after playing with a couple of the others
• Rockbox uses various themes. These don't require any real programming just artistic skill

3 Things I wish I knew when I started with Rockbox

- The backlight will go out every 5 seconds by default, you might start to think something is broken
- Don't be afraid to hit the power button it is the main way to get out of most of the plugins
- Don't pick the minimal install, space is cheap even in flash players

Fourth Thing I wish I knew when I started with Rockbox

- Ubuntu 7.10 Gutsy Gibbon will tend to mount your mp3 player as Read Only regardless of how you tell it to mount it
- Just ran into this Sunday when I was putting Rockbox onto my Sansa C240

How does Rockbox compare to IpodLinux?

- IpodLinux has some larger apps such as Weather
- IpodLinux is only for Ipods
- Rockbox runs on a lot of other players
- Rockbox is a much simpler kernel (cooperative multi-tasking, simple memory protection)
- Rockbox has even been ported to 1st Generation Ipods

Example of a Rockbox Plugin

Lets take a look at jewels.c in the plugins directory

- Note: the basic #includes
- Note: the code to handle multiple resolutions
- Jewels.c is only 1869 lines
- Along with a handful of bitmap files

How is it to Develop for?

- The pre-built environments supplied are all Windows/Cygwin
- All based on Open Source tools so Linux/Mac ports are possible
- The UI sim can give you a pretty good idea about your app, without the usual plug it in, update, unplug, reboot, test cycle
- There is also an emulator out for Sansa E2x0 which can run Rockbox

Where I'm currently at with Rockbox

- Building my cross compiler environment on Linux and am starting to review the H10 version
- Thinking about getting the FM radio working if possibly for the Iriver H10/20gb
- Mostly just using it as an end user
- Nice to be able to Ogg files
- Hooked on Jewels

Where I'm currently at with Rockbox

- Just bought and installed Rockbox on a Sansa C240 I bought the other day
- I have ordered a Tatung m100 player, going to examine a Rockbox port for the player
- The Tatung m100 is a player that sells for $20.00 on Tiger Direct, it only holds 512mb though :-(

Advice

If you are in the market for an Mp3 player you might try and get one of the well supported ones

Archos, Cowon, Iriver H10, Ipod Minis, Sansa Sandisk players

TigerDirect has Iriver H10/20gbs (Refurbished) for $99.99 last I checked
A lot of places have Sansa C2x0 and E2x0 on sale

More Advice

- Rockbox has really good manuals written for the players they support. Read at least the part up to the install before you start dorking with your player
- You'll sometimes have to reset/trick your player into a mode where the USB allows you access to the underlying system. Take your time and do a couple of resets into the original firmware first to make sure everything is Ok.
- Before doing anything with firmwares make sure your battery is fully charged

Future of Rockbox

- Pretty good as long as players are semi-open
- Don't expect to see Rockbox on the Zune until 3rd quarter of next year
- Developers are working on creating an App version of the Rockbox interface that runs as application on top of an Mp3 player
- GPL v3 licensing is starting to pop up on the forums a bit
- It is a classic example of a project with a purpose

Threats to Rockbox

• Rockbox got a pretty nasty Cease and Desist letter from Popcap games about similarities between Bejeweled and the Jewels plugin for Rockbox
• Looking through the website it is kinda of difficult to figure out what the legal structure of Rockbox is, they look to be based in Sweden

Threats to Rockbox

- Some players such as the Ipod 3rd Generation Nano are making it more difficult to put alternative firmware on their players
- Manufacturers change hardware on their players sometime without any way of telling
- Rockbox makes an effort to NOT play DRM which currently leaves them outside most DMCA violations

References

- http://www.rockbox.org
- http://www.rockbox.org/twiki
- http://www.ipodlinux.org

Summary

- Rockbox is an impressive project when you consider how many different players it works on
- It is a great way to be able to play format that the typical Mp3 players don't support