Packages - Freedom Issue #1172

bladerf: FPGA firmwares can't be "compiled" with free software.

2017-01-12 11:48 AM - GNUtoo

Status:	fixed		**% Done:**	100%
Priority:	bug			
Assignee:	oaken-source			
Category:				

Description

Hi,

Installing bladerf (pacman -S bladrf) gives us the following FPGA firmware[2]:

```
/usr/share/bladerf/fpga/hostedx115.rbf
/usr/share/bladerf/fpga/hostedx40.rbf
```

According to their website[1] they use an "Altera Cyclone IV FPGA",
and as far as I know, there is no free software tools to compile[3] the source code[4] into the firmware[2].

I also wonder about the license and tools needed to build this firmware:

```
/usr/share/bladerf/firmware/bladeRF_fw_v2.0.0.img
```

```
# strings /usr/share/bladerf/firmware/bladeRF_fw_v2.0.0.img | grep -i threadx
Copyright (c) 1996-2008 Express Logic Inc. * ThreadX ARM9/RVDS Version G5.1.5.1 SN: 2923-115-1301
*
```

Also ThreadX[5] seem to be a proprietary embedded operating system.

This firmware might be for the following chip:

```
The Cypress FX3 microcontroller is the ideal solution with a powerful ARM9 processor and enough ba
ndwidth to saturate the full duplex 5Gbps USB 3.0 link.
```

Note that we have some ARM compilers in parabola, so we could build this firmware if it's free software:

```
community/arm-none-eabi-binutils
community/arm-none-eabi-gcc
community/arm-none-eabi-gdb
community/arm-none-eabi-newlib
```

Also note that I have no bladerf, and no access to such hardware.
I only know that very few FPGA are usable with free software, and at the time of writing,
only various FPGAs from the ICE40 series are.

References:
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[1] https://www.nuand.com/
[2] This is called "bitstream" in the FPGA jargon
[3] This is called "synthetize" in the FPGA jargon
[4] I've no idea how this is called, but the kind of language they use is
called "Hardware description language(HDL)"
[5] https://en.wikipedia.org/wiki/ThreadX

History

#1 - 2018-01-25 05:08 PM - oaken-source

- % Done changed from 0 to 100

- Assignee set to oaken-source

- Status changed from open to fixed

I verified that the firmware blobs and fpga images can not be build using only free tools, and indeed do contain nonfree binary objects.

I added bladerf to the blacklist and packaged a libre, deblobbed version.

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