

NOTES: WR switch

22 May. 2012

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1 WR Switch HDL

1.1 Setup

You need to setup the following tools:

- git
- hdlmake
- xilinx ise
- lm32 cross compiler

You should look at the guide [ohwr_development.pdf](#) to install all these tools

1.1.1 wr-switch-hdl

Get the latest version from git:

```
$ git clone git://ohwr.org/white-rabbit/wr-switch-hdl.git
```

1.2 Compile RT

Setup the *CROSS_COMPILE* variable

```
$ export CROSS_COMPILE="/opt/cc/lm32/bin/lm32-elf-";
```

Then execute **make** in *wr-switch-hdl/rt*.

1.3 Make and EDK bitstream loadable from ARM:

If you need to use Xilinx EDK to create a bitstream, you need to set it loadable from ARM.

In order to do this you need to go in EDK to **Project Files > Bitgen files (etc/bitgen.ut)**

And then add the following:

```
-g TdoPin:PULLNONE
-g StartUpClk:Cclk
#add other options here.
-d
-g Binary:yes
-g CRC:Enable
-g ConfigRate:50
-g UnusedPin:PullDown
-g DONE_cycle:4
-g GTS_cycle:5
-g GWE_cycle:6
```

2 WR Switch SW

2.1 Setup development enviroment

In order to run the switch in development environment¹ you need to setup

- dhcp server
- tftp server
- nfs server

here a small tutorial² that show you a simple way to install of these package.

2.1.1 DHCP + TFTP: dnsmasq package

An easy way to setup DHCP & TFTP server is given by the package dnsmasq³ :

```
$ sudo apt-get install dnsmasq
```

then, you must open the file `/etc/dnsmasq.conf` and edit the following lines:

```
# specified interfaces
interface=eth0
# Dhcp range
dhcp-range=192.168.7.2,192.168.7.15,12h
# Enable dnsmasq's built-in TFTP server
enable-tftp
# Set the root directory for files availble via FTP.
tftp-root=/tftpboot
```

Once you have saved the file, you just need to restart the service

```
$ sudo service dnsmasq restart
```

2.1.2 NFS Server

First install the packages

```
$ sudo apt-get install nfs-kernel-server nfs-common
```

Then edit the file `/etc/exports` and add:

```
/tftpboot 192.168.7.0/24(rw,no_root_squash,subtree_check)
```

¹The development environment use Ubuntu LTS 12.04

²In this tutorial we have used the LAN 192.168.7.0/24, you can change it to the desired value.

³Dnsmasq only permit to install a tftp server in read mode (write is not allowed)

2.2 Barebox

Here an example how partition should work.

- Mark the first partition with the partition ID “53” and copy the bootlets into this partition (currently not part of @b barebox!).
- Copy the default @b barebox environment into the second partition (no filesystem required).
- Copy the kernel into the third partition (no filesystem required).
- Create the root filesystem in the 4th partition. You may copy an image into this partition or you can do it in the classic way: mkfs on it, mount it and copy all required data and programs into it.

2.3 Flashing NAND

3 Convert RootFS to JFFS2

To convert your rootfs to a jffs2 image you need to install `mtd-utils`

```
$ sudo apt-get install mtd-utils
```

And then you need to run:

```
$ mkfs.jffs2 --little-endian --eraseblock=0x20000 -n --pad -d ./rootfs -o jffs2-root.img
```

4 Flashing from the switch

You need to erase both flash partition, and then write (with padding) the image.

```
flash_eraseall /dev/mtd0
nandwrite --pad /dev/mtd0 /zImage-usb
flash_eraseall /dev/mtd1
nandwrite --pad /dev/mtd1 /jffs2-root.img
```

4.1 FAQ

4.1.1 Problems with CP2102x USB to TTL:

In case you have problems to TX to the UART with the USB cp2102 chip you should not use minicom but tinyserial: <http://brokestream.com/tinyserial.html> You can also disable hardware flow control.

```
Ctrl+A, 0 > Serial Port Setup > F
```