Cross-compiling HOWTO

In a machine running Debian 7

Cross-compile simplemux.c with ROHC 1.7.0 in a Debian 7 machine, for running it in a TP-Link TL-WR1043ND (version 2) Access Point.

Install the OpenWRT firmware in the Access Point

Go to

```
http://wiki.openwrt.org/toh/tp-link/tl-wr1043nd
```

Go to "Downloads for TL-WR1043ND v2.x"

```
http://wiki.openwrt.org/toh/tp-link/tl-wr1043nd#downloads_for_tl-
wr1043nd_v2x
```

Download the "Factory" firmware

```
http://downloads.openwrt.org/barrier_breaker/14.07/ar71xx/generic/open
wrt-ar71xx-generic-tl-wr1043nd-v2-squashfs-factory.bin
```

Go to the Access Point and flash this `.bin` file in it.

In the Debian machine, download the Toolchain from OpenWRT.org

Go to

```
https://downloads.openwrt.org/snapshots/trunk/ar71xx.mikrotik/
```

And download this file:

```
https://downloads.openwrt.org/snapshots/trunk/ar71xx.mikrotik/OpenWrt-
Toolchain-ar71xx-for-mips_34kc-gcc-4.8-linaro_uClibc-0.9.33.2.tar.bz2
```

Extract it in

```
/home/proyecto (if the username is "proyecto")
```

In the Debian machine, modify the environment variable "CC"

Modify the CC variable in order to make the compiler be the MIPS one:

```
# export CC=/home/proyecto/OpenWrt-Toolchain-ar71xx-for-mips_34kc-gcc-
4.8-linaro_uClibc-0.9.33.2/toolchain-mips_34kc_gcc-4.8-linaro_uClibc-
0.9.33.2/bin/mips-openwrt-linux-gcc
```

Use `#set` to confirm that `CC` has this value:

```
(…)
BASH_VERSION='4.2.37(1)-release'
CC=/home/proyecto/OpenWrt-Toolchain-ar71xx-for-mips_34kc-gcc-4.8-
linaro_uClibc-0.9.33.2/toolchain-mips_34kc_gcc-4.8-linaro_uClibc-
0.9.33.2/bin/mips-openwrt-linux-gcc
COLORTERM=gnome-terminal
(…)
```

In the Debian machine, download ROHC (file rohc-1.7.0.tar.xz from the ROHC web site)

Download the ROHC file from the web:

`http://rohc-lib.org/download/rohc-1.7.x/1.7.0/rohc-1.7.0.tar.xz`

Extract the file to the toolchain directory:

`/home/proyecto/OpenWrt-Toolchain-ar71xx-for-mips_34kc-gcc-4.8-linaro_uClibc-0.9.33.2/toolchain-mips_34kc_gcc-4.8-linaro_uClibc-0.9.33.2/rohc-1.7.0`

In the Debian machine, install the ROHC library in the toolchain

Go to this directory

`/home/proyecto/OpenWrt-Toolchain-ar71xx-for-mips_34kc-gcc-4.8-linaro_uClibc-0.9.33.2/toolchain-mips_34kc_gcc-4.8-linaro_uClibc-0.9.33.2/rohc-1.7.0/`

Run:

```
#./configure --disable-app-fuzzer --disable-app-performance --disable-app-sniffer --enable-app-tunnel --disable-app-stats --disable-linux-kernel-module --disable-doc --disable-doc-man --host=mips --prefix=/home/proyecto/OpenWrt-Toolchain-ar71xx-for-mips_34kc-gcc-4.8-linaro_uClibc-0.9.33.2/toolchain-mips_34kc_gcc-4.8-linaro_uClibc-0.9.33.2/
```

`#make all`

`#make check`

`#make install`

After this, you have created in the `lib` folder of the toolchain the `.a` files required for compiling with static libraries (`librohc-common.a librohc-comp.a` y `librohc-decomp.a`)

In the Debian machine, compile the .c file

This is the cross-compiling instruction:

The source file name is `/home/proyecto/simplemux/simplemux.c`

The created executable is `/home/proyecto/simplemux-mips`

`#/home/proyecto/OpenWrt-Toolchain-ar71xx-for-mips_34kc-gcc-4.8-linaro_uClibc-0.9.33.2/toolchain-mips_34kc_gcc-4.8-linaro_uClibc-0.9.33.2/`bin/mips-openwrt-linux-gcc -o /home/proyecto/simplemux-mips –g -Wall /home/proyecto/simplemux/simplemux.c -I ./include/ -L ./lib/ -lrohc_comp -lrohc -lrohc_common -lrohc_decomp –static

Now you can copy the executable file to the Access Point with MIPS architecture and run it there.