

## 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](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/openwrt-ar71xx-generic-tl-wr1043nd-v2-squashfs-factory.bin](http://downloads.openwrt.org/barrier_breaker/14.07/ar71xx/generic/openwrt-ar71xx-generic-tl-wr1043nd-v2-squashfs-factory.bin)

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

### 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](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”)

### 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
```

(...)

### 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
```

## Run Configure

```
/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# ./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/
```

## Install 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`)

## 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.