

# OpenWRT 19.07.x for RouterBOARD 750Gr3

## Introduction

- We created this page for the 19.07 release of OpenWRT since the CoovaChilli that comes standard included with this release of OpenWRT **DOES NOT INCLUDE** the JSON Interface (Utilised by RADIUSdesk).
- Our instructions here will help you build your own built of OpenWRT which will include CoovaChilli that has the support for the JSON interface included.

## Prepare the system

- We assume you have a standard install of Ubuntu 18.04 or Ubuntu 20.04
- Install the required packages to ensure the SDK can build the firmware

```
sudo apt-get update
sudo apt-get install build-essential subversion git-core libncurses5-dev
zlib1g-dev gawk flex quilt libssl-dev xsltproc libxml-parser-perl unzip
mercurial
```

## Create the location for the SDK

- Our suggestion is to create a folder that will indicate the version of the firmware you'll be building.
- Here we create a folder for the 19.07.6 release (The latest for the 19.07 branch).

```
# Create the working directory
mkdir 19.07.6
# Change to our working directory
cd 19.07.6
```

## Checkout the SDK

- Do a clean checkout of the OpenWRT repository

```
git clone https://git.openwrt.org/openwrt/openwrt.git
```

- This repository has various branches. To see which branches are available and which one we are currently set to use, issue the following command.

```
#We may first need to change our directory to the openwrt directory
cd openwrt
git branch -a
#Also to see the tags
```

## git tag -l

- We will be checking out the v19.07.6 tag.

```
git checkout v19.07.6
```

- Confirm that this **v19.07.6** is now checked out.

## git branch

- Update the package feeds

```
./scripts/feeds update
```

## Install the required packages

- Ensure the following packages are installed since they are required by the firmware

```
./scripts/feeds install coova-chilli  
./scripts/feeds install luci  
./scripts/feeds install luci-theme-material
```

## Tweak CoovaChilli to include support for JSON

- We will borrow some things from the config files inside the the master branch of OpenWRT to include the option for the JSON interface when configuring the firmware before building it.
- Edit the **openwrt/feeds/packages/net/coova-chilli/Config.in** to look like this (Repalce with this file)

### Config.in

```
# CoovaChilli advanced configuration  
  
if PACKAGE_coova-chilli  
  
config COOVACHILLI_PROXY  
    bool "Enable support for chilli proxy. Required for AAA Proxy  
through http"  
    default n  
  
config COOVACHILLI_REDIR  
    bool "Enable support for redir server. Required for uamregex"  
    default n  
  
config COOVACHILLI_MINIPORTAL  
    bool "Enable support Coova miniportal"  
    default n
```

```
config COOVACHILLI_USERAGENT
    bool "Enable recording user-agent"
    default n

config COOVACHILLI_UAMDOMAINFILE
    bool "Enable loading of mass uamdomains from file"
    default n

config COOVACHILLI_LARGE_LIMITS
    bool "Enable larger limits for use with non-embedded systems"
    default n

config COOVACHILLI_JSONINTERFACE
    bool "Enable the JSON interface for the CoovaChilli Controller"
    default n

choice
    prompt "SSL library"
    default COOVACHILLI_NOSSL

config COOVACHILLI_NOSSL
    bool "No SSL support"

config COOVACHILLI_WOLFSSL
    bool "wolfSSL"

config COOVACHILLI_OPENSSL
    bool "OpenSSL"

endchoice

endif
```

- Edit the **openwrt/feeds/packages/net/coova-chilli/Makefile** to look like this (Replace existing one)

### Makefile

```
#
# Copyright (C) 2007-2018 OpenWrt.org
#
# This is free software, licensed under the GNU General Public License
# v2.
# See /LICENSE for more information.
#

include $(TOPDIR)/rules.mk

PKG_NAME:=coova-chilli
```

```
PKG_VERSION:=1.4
PKG_RELEASE:=10

PKG_SOURCE:=$(PKG_NAME)-$(PKG_VERSION).tar.gz
PKG_SOURCE_URL=https://codeload.github.com/coova/coova-chilli/tar.gz/$(PKG_VERSION)?
PKG_HASH:=987647a4c8efe7b1e2d7108d56068e3bd7830d326680f0eaa2c705e4c59c46d9

PKG_MAINTAINER:=Jaehoon You <teslamint@gmail.com>
PKG_LICENSE:=GPL-2.0-or-later
PKG_LICENSE_FILES:=COPYING

PKG_FIXUP:=autoreconf
PKG_INSTALL:=1
PKG_BUILD_PARALLEL:=0

PKG_CONFIG_DEPENDS:= \
    COOVACHILLI_JSONINTERFACE \
    COOVACHILLI_LARGE_LIMITS \
    COOVACHILLI_MINIportal \
    COOVACHILLI_NOSSL \
    COOVACHILLI_OPENSSL \
    COOVACHILLI_PROXY \
    COOVACHILLI_REDIRECT \
    COOVACHILLI_UAMDOMAINFILE \
    COOVACHILLI_USERAGENT \
    COOVACHILLI_WOLFSSL \
    IPV6

include $(INCLUDE_DIR)/package.mk
include $(INCLUDE_DIR)/kernel.mk

define Package/coova-chilli
    SUBMENU:=Captive Portals
    SECTION:=net
    CATEGORY:=Network
    DEPENDS:=+kmod-tun +librt +COOVACHILLI_MINIportal:haserl \
    +COOVACHILLI_WOLFSSL:libwolfssl +COOVACHILLI_OPENSSL:libopenssl \
    +COOVACHILLI_JSONINTERFACE:libjson-c
    TITLE:=Wireless LAN HotSpot controller (Coova Chilli Version)
    URL:=https://coova.github.io/
    MENU:=1
endef

define Package/coova-chilli/description
    CoovaChilli is an open source access controller for wireless LAN
    access points and is based on ChilliSpot. It is used for
    authenticating
endef
```

```

    users of a wireless (or wired) LAN. It supports web based login
    (UAM)
    which is today's standard for public HotSpots and it supports
    Wireless
    Protected Access (WPA) which is the standard of the future.
    Authentication, authorization and accounting (AAA) is handled by
    your
    favorite radius server.
endef

define Package/coova-chilli/config
    source "$(SOURCE)/Config.in"
endef

define KernelPackage/ipt-coova
    URL:=http://www.coova.org/CoovaChilli
    SUBMENU:=Netfilter Extensions
    DEPENDS:=coova-chilli +kmod-ipt-core +libxtables
    TITLE:=Coova netfilter module
    FILES:=$(PKG_BUILD_DIR)/src/linux/xt_*.$(LINUX_KMOD_SUFFIX)
    AUTOLOAD:=$(call AutoProbe,xt_coova)
endef

define KernelPackage/ipt-coova/description
    Netfilter kernel module for CoovaChilli
    Includes:
    - coova
endef

DISABLE_NLS=

TARGET_CFLAGS += $(FPIC) -Wno-error

CONFIGURE_VARS += \
    ARCH="$(LINUX_KARCH)" \
    KERNEL_DIR="$(LINUX_DIR)"

MAKE_FLAGS += \
    ARCH="$(LINUX_KARCH)" \
    KERNEL_DIR="$(LINUX_DIR)"

MAKE_INSTALL_FLAGS += \
    ARCH="$(LINUX_KARCH)" \
    KERNEL_DIR="$(LINUX_DIR)" \
    INSTALL_MOD_PATH="$(PKG_INSTALL_DIR)"

define Build/Prepare
$(call Build/Prepare/Default)
    ( cd $(PKG_BUILD_DIR) ; \
        [ -f ./configure ] || { \
            ./bootstrap ; \

```

```
    } \  
  ) \  
endif \  
  
define Build/Configure \  
  $(call Build/Configure/Default, \  
  $(if $(CONFIG_COOVACHILLI_PROXY),--enable,--disable)-chilliproxy \  
  $(if $(CONFIG_COOVACHILLI_REDIR),--enable,--disable)-chilliredir \  
  $(if $(CONFIG_COOVACHILLI_MINIportal),--enable,--disable)-miniportal \  
  $(if $(CONFIG_COOVACHILLI_USERAGENT),--enable,--disable)-useragent \  
  \  
  $(if $(CONFIG_COOVACHILLI_LARGElimits),--enable,--disable)-largelimits \  
  $(if $(CONFIG_COOVACHILLI_JSONINTERFACE),--enable,--disable)-libjson \  
  $(if $(CONFIG_COOVACHILLI_JSONINTERFACE),--enable,--disable)-json \  
  $(if $(CONFIG_COOVACHILLI_UAMDOMAINFILE),--enable,--disable)-uamdomainfile \  
  $(if $(CONFIG_IPV6),--with,--without)-ipv6 \  
  $(if $(CONFIG_COOVACHILLI_WOLFSSL),--with,--without)-cyassl \  
  $(if $(CONFIG_COOVACHILLI_OPENSSL),--with,--without)-openssl \  
  $(if $(CONFIG_PACKAGE_kmod-ipt-coova),--with-nfcoova) \  
  ) \  
endif \  
  
define Package/coova-chilli/conffiles \  
/etc/config/chilli \  
endif \  
  
define Package/coova-chilli/install \  
  $(INSTALL_DIR) $(1)/etc \  
  $(INSTALL_CONF) $(PKG_INSTALL_DIR)/etc/chilli.conf $(1)/etc/ \  
  $(INSTALL_DIR) $(1)/etc/chilli \  
  $(CP) $(PKG_INSTALL_DIR)/etc/chilli/* $(1)/etc/chilli/ \  
  $(INSTALL_DIR) $(1)/etc/hotplug.d/iface \  
  $(INSTALL_DATA) ./files/chilli.hotplug $(1)/etc/hotplug.d/iface/30-chilli \  
  $(INSTALL_DIR) $(1)/usr/sbin \  
  $(INSTALL_BIN) $(PKG_INSTALL_DIR)/usr/sbin/chilli* $(1)/usr/sbin/ \  
  $(INSTALL_DIR) $(1)/usr/lib/ \  
  $(CP) $(PKG_INSTALL_DIR)/usr/lib/lib*.so.* $(1)/usr/lib/ \  
  $(if $(CONFIG_PACKAGE_kmod-ipt-coova), \  
    $(INSTALL_DIR) $(1)/usr/lib/iptables; \  
    $(CP) $(PKG_INSTALL_DIR)/usr/lib/iptables/lib*.so $(1)/usr/lib/iptables/ \  
  ) \  
  $(INSTALL_DIR) $(1)/etc/init.d \  
  $(INSTALL_BIN) files/chilli.init $(1)/etc/init.d/chilli
```

```
$(INSTALL_DIR) $(1)/etc/config
$(INSTALL_DATA) files/chilli.config $(1)/etc/config/chilli
endif

$(eval $(call BuildPackage,coova-chilli))
$(eval $(call KernelPackage,ipt-coova))
```

## Select target system and model

- Under the **openwrt** folder type:

```
make menuconfig
```

- For **Target System** select **MediaTek Ralink MIPS**
- For **Subtarget** select **MT7621based boards**
- For **Profile** select **Mikrotik RouterBOARD 750Gr3**

Next we will select the packages to include

## Select required packages

- The default package selection by OpenWRT is pretty good to get a standard working firmware done.
- We will do the following additional selections

Package	Location	Comment
coova-chilli	Network → Captive Portals	Select <b>Enable the JSON interface for the CoovaChilli Controller, Enable support Coova miniportal and OpenSSL as SSL Library</b>
luci	Luci → Collections	Required for web management
luci-theme-material	Luci → Themes	Modern theme as a nice-to-have

- After that you can save and exit

## Kick off the built

- Everything is now in place to start the firmware built
- Enter the following under the **openwrt** folder

```
make
```

- If the build completes with success it will be located here:

```
ls -l bin/targets/ramips/mt7621/
total 9412
-rw-r--r-- 1 system system 1590 Feb 16 15:39 config.buildinfo
```

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```
-rw-r--r-- 1 system system 343 Feb 16 15:39 feeds.buildinfo
-rw-r--r-- 1 system system 3196 Feb 16 15:41 openwrt-ramips-mt7621-
device-mikrotik-rb750gr3.manifest
-rwxr-xr-x 1 system system 4692436 Feb 16 15:41 openwrt-ramips-mt7621-
mikrotik_rb750gr3-initramfs-kernel.bin
-rw-r--r-- 1 system system 4915980 Feb 16 15:41 openwrt-ramips-mt7621-
mikrotik_rb750gr3-squashfs-sysupgrade.bin
drwxr-xr-x 2 system system 4096 Feb 16 15:40 packages
-rw-r--r-- 1 system system 628 Feb 16 15:41 sha256sums
-rw-r--r-- 1 system system 18 Feb 16 15:39 version.buildinfo
```

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