MediaTek Linux SDK Release Notes

Version: 1.1
Release date: 2013-7-19

Document Revision History

Revision	Date	Author	Description
Draft	*Jason Lin*	*Initial draft*	*2010/2/1*
	Yanfei	*Add BSP Compile SOP*	*2010-4-29*
	xyyou	*Formal release*	*2010-9-15*
	yzwang	*Formal release*	*2011-5-9*
	fredli	*Formal release*	*2011-12-22*
	Chih Huang	*Formal release*	*2012-2-14*
	Pork Chen	*Formal release*	*2013-7-19*

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1 Introduction

This document describes the Linux SDK release (version 7.3.94.4) for MediaTek CPE, which supports the following chips:

- MT751x

The SDK package contains the following items:

- GNU MIPS toolchain used to compile source code
- Linux bootloader image
- Linux kernel and rootfs images
- Linux kernel source code
- Linux user land applications
- Linux interface drivers for reference board.

2 Version History

2.1 New Feature in this release

1) New features in this release (version 7.3.94.4)

Module	New Feature	Notes
WiFi	Upgrade the wifi Multi-driver RT5392/RT3593/RT5392 driver to V2.7.0.5	
System	Add Dram PHY Calibration for DDR2/DDR3	
	Extend Bootrom from 64 to 128K	
	Upgrade DMT version. FW version : V5.3.2.6_A_A60901 HwVer:T14.F7_0.0	

3 MediaTek SDK release Linux Architecture

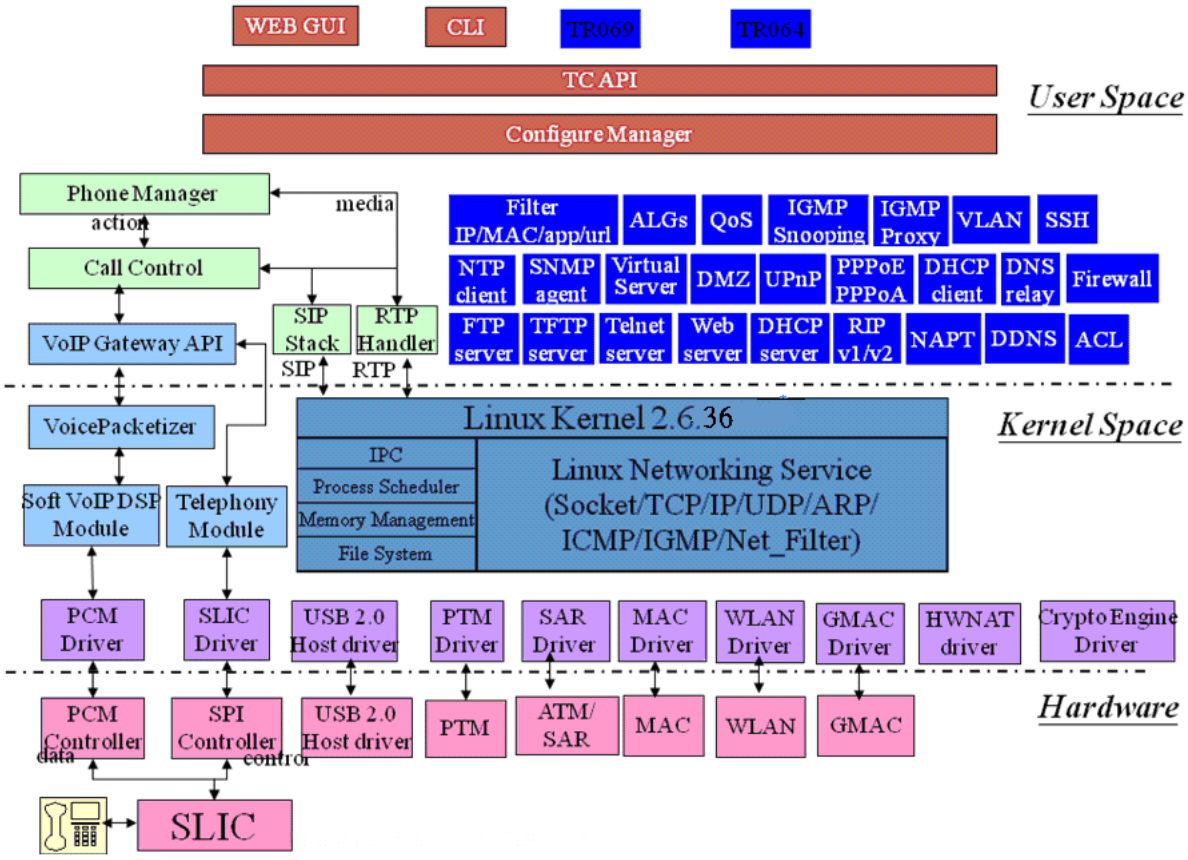


Figure 1 Linux Software Architecture

4 MediaTek SDK release supported Features

This SDK is the Linux platform for MediaTek CPE and it supports MT7510.This SDK release supports the following features listed in the table.

Feature	MT7510	Start version
VDSL Compliant		
ITU G.993.2 (VDSL2)	Y	7.3.94.4
ITU G.998.4 (G.inp)	Y	7.3.94.4
ITU G.993.5 (G.vector)	Y	7.3.94.4
Support 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a profiles	Y	7.3.94.4
Support Annex A, Annex B, Annex C	Y	7.3.94.4
Support ATM and PTM modes	Y	7.3.94.4
VDSL2/ADSL2+ multimode	Y	7.3.94.4
Support dual-latency	Y	7.3.94.4
Support Robust Overhead Channel	Y	7.3.94.4
Bit swap	Y	7.3.94.4
Seamless Rate Adaptation	Y	7.3.94.4
SOS	Y	7.3.94.4
Loop Diagnostic Mode	Y	7.3.94.4
PTM Support	Y	7.3.94.4
ADSL Compliant		
Full ADSL2+/2/1 standards	Y	7.3.94.4
Annex A, B, I, J, L & M	Y	7.3.94.4
ANSI T1.413 Issue 2	Y	7.3.94.4
ITU G.992.1 (G.dmt)	Y	7.3.94.4
ITU G.992.2 (G.lite)	Y	7.3.94.4
ITU G.992.3 ADSL2 (G.dmt.bis)	Y	7.3.94.4
ITU G.992.4 (G.lite.bis)	Y	7.3.94.4
ITU G.992.5 (G.dmt.bisplus)	Y	7.3.94.4
ITU G.994.1 (G.hs)	Y	7.3.94.4
ITU G.995.1	Y	7.3.94.4
ITU G.996.1	Y	7.3.94.4
ITU G.997.1	Y	7.3.94.4
ITU-T K.2.1	Y	7.3.94.4
Support Multimode	Y	7.3.94.4
Support Fast path and Interleave path	Y	7.3.94.4

Echo Cancellation	Y	7.3.94.4
Trellis Coding	Y	7.3.94.4
Bit Swapping	Y	7.3.94.4
Seamless Rate Adaptation	Y	7.3.94.4
Network Timing Reference	Y	7.3.94.4
Dying Gasp	Y	7.3.94.4
Downstream 4kbps granularity, upstream 32kbps granularity	Y	7.3.94.4
1bit constellation	Y	7.3.94.4
Bit loading on pilot tone	Y	7.3.94.4
CPE determining Pilot tone	Y	7.3.94.4
DELT	Y	7.3.94.4
Dual latency independently in each direction	Y	7.3.94.4
Extend bit swapping	Y	7.3.94.4
Initialization time < 60 sec	Y	7.3.94.4
Masked mode	Y	7.3.94.4
Multiple bearers	Y	7.3.94.4
Power Saving Mode	Y	7.3.94.4
L3 to L0 initialization	Y	7.3.94.4
ATM Support		
MultiProtocol over AAL5 (RFC 1483/2684)	Y	7.3.94.4
VC and LLC Multiplexing	Y	7.3.94.4
Support 8 PVCs	Y	7.3.94.4
Traffic Shaping (ATM QoS) UBR, CBR, VBR-rt,VBR-nrt	Y	7.3.94.4
OAM F4/F5 loop-back, AIS, and RDI OAM cells	Y	7.3.94.4
UNI 3.1/4.0 Permanent Virtual Circuits	Y	7.3.94.4
GFC field	Y	7.3.94.4
VPI range 0-255	Y	7.3.94.4
VCI range 1-65535	Y	7.3.94.4
Keeping of reserved values	Y	7.3.94.4
Creating of PTI field	Y	7.3.94.4
Creating of CLP field	Y	7.3.94.4
Calculating of HEC field	Y	7.3.94.4
Means of VPI/VCI use	Y	7.3.94.4
Operational data rate – Upstream	Y	7.3.94.4
Operational data rate – Downstream	Y	7.3.94.4
PVC statistics	Y	7.3.94.4

Precise Peak Cell Rate traffic shaping on a per-VCC basis	Y	7.3.94.4
Network Service		7.3.94.4
Ipv4	Y	7.3.94.4
Ipv6 phase II core for router ready logo	Y	7.3.94.4
IPV6 function:, Telnet server, Tftp server, 6RD ,Ftp server, Ds-lite f	Y	7.3.94.4
DHCP Server/Relay	Y	7.3.94.4
DHCP Client (WAN Port)	Y	7.3.94.4
DHCP port filter	Y	7.3.94.4
DSCP Filter	Y	7.3.94.4
DNS Proxy	Y	7.3.94.4
PPPoE	Y	7.3.94.4
PPPoA	Y	7.3.94.4
RFC 2684 Bridging/Routing	Y	7.3.94.4
NAT/PAT	Y	7.3.94.4
RIP V1/V2	Y	7.3.94.4
Static Routing	Y	7.3.94.4
ALG	Y	7.3.94.4
DMZ	Y	7.3.94.4
Virtual Server	Y	7.3.94.4
SNTP	Y	7.3.94.4
PPPoE passthrough (Bridge Interface)	Y	7.3.94.4
uPnP	Y	7.3.94.4
DSCP/802.1p marking	Y	7.3.94.4
IGMP Snooping v1/v2/v3	Y	7.3.94.4
IGMP Snooping v3 (software)	Y	7.3.94.4
Hardware IGMP Snooping v1/v2	Y	7.3.94.4
IGMP Qos	Y	7.3.94.4
Port binding(LAN/WAN/USB/ WLAN)	Y	7.3.94.4
Port-based VLAN	Y	7.3.94.4
Bandwidth Control	Y	7.3.94.4
Traffic shaping (SP/WRR)	Y	7.3.94.4
Traffic Control (RED) (Only support when open HW QOS)	Y	7.3.94.4
Traffic Control (WRED) (Only support when open HW QOS)	Y	7.3.94.4
IP Alias	Y	7.3.94.4
VPN (IPSec, PPTP, L2TP) pass-through	Y	7.3.94.4
DHCP option 60	Y	7.3.94.4

802.1D MAC Bridge	Y	7.3.94.4
IpoA	Y	7.3.94.4
Ethernet /ADSL / WLAN statistics	Y	7.3.94.4
Static IP assignment from DHCP server	Y	7.3.94.4
NAT		
1-1 NAT	Y	7.3.94.4
NAT and NAPT	Y	7.3.94.4
NAT 1024 sessions capacity	Y	7.3.94.4
Universal Plug and Play		
UpnP based auto-configuration	Y	7.3.94.4
UpnP based port forwarding	Y	7.3.94.4
Internet Gateway Device	Y	7.3.94.4
Voice		
G.711 A/U	N	7.3.94.4
G711 VAD/CNG	N	7.3.94.4
G711 PLC	N	7.3.94.4
G729 AnnexA/B	N	7.3.94.4
G722	N	7.3.94.4
G726	N	7.3.94.4
FAX: 711 pass through / T.38	N	7.3.94.4
Echo canceller – up to 48ms	N	7.3.94.4
RTP/RTCP – RFC 3350	N	7.3.94.4
Jitter buffer – Dynamic/Static jitter buffer. Up to 700 ms	N	7.3.94.4
Caller ID – Type1 / 2	N	7.3.94.4
Call forward/transfer/Return/DND/DOD	N	7.3.94.4
Anonymous calling / call blocking	N	7.3.94.4
3 way conference	N	7.3.94.4
Digitmap	N	7.3.94.4
Country setting	N	7.3.94.4
DTMF generation – RFC 2833 Relay / In band gerneration	N	7.3.94.4
Digital gain - +/- 20 dbm	N	7.3.94.4
FxO – loop current detection	N	7.3.94.4
FxO – caller ID detection	N	7.3.94.4
FxO – hook flash detection	N	7.3.94.4
Security		
NAT	Y	7.3.94.4
Prevent port scanning & packet	Y	7.3.94.4

attack		
DoS Attack protection	Y	7.3.94.4
SYN Flooding	Y	7.3.94.4
Ping of Death,	Y	7.3.94.4
Teardrop	Y	7.3.94.4
LAND attack	Y	7.3.94.4
Management Access Control for LAN/WAN sides	Y	7.3.94.4
IP with zero length	Y	7.3.94.4
Smurf Attach	Y	7.3.94.4
TCP Null Scan	Y	7.3.94.4
Stateful Packet Inspection(SPI)	Y	7.3.94.4
IP filtering	Y	7.3.94.4
MAC filtering	Y	7.3.94.4
URL filter	Y	7.3.94.4
Security IPV6		
NAT	Y	7.3.94.4
Prevent port scanning & packet attack	Y	7.3.94.4
DoS Attack protection	Y	7.3.94.4
SYN Flooding	Y	7.3.94.4
Ping of Death,	Y	7.3.94.4
Teardrop	Y	7.3.94.4
LAND attack	Y	7.3.94.4
Management Access Control for LAN/WAN sides	Y	7.3.94.4
IP with zero length	Y	7.3.94.4
Smurf Attach	Y	7.3.94.4
TCP Null Scan	Y	7.3.94.4
Stateful Packet Inspection(SPI)	Y	7.3.94.4
IP filtering	Y	7.3.94.4
MAC filtering	Y	7.3.94.4
URL filter	Y	7.3.94.4
WLAN		
802.11 b/g/n	Y	7.3.94.4
WPS(1.0 and 2.0)	Y	7.3.94.4
Multiple SSIDs	Y	7.3.94.4
Rate adaptation automatically	Y	7.3.94.4
Power saving	Y	7.3.94.4
Max Channel number	Y	7.3.94.4
Auto channel selection	Y	7.3.94.4
Tx power adjustment	Y	7.3.94.4

WMM support	Y	7.3.94.4
64-bit&128-bit WEP	Y	7.3.94.4
WPA-PSK & WPA2-PSK	Y	7.3.94.4
MAC address filtering	Y	7.3.94.4
Maximum users in the wireless LAN	Y	7.3.94.4
802.1X	Y	7.3.94.4
Dual Band Concurrent	Y	7.3.37.6
Device Management		
Web Configuration	Y	7.3.94.4
Telnet Management	Y	7.3.94.4
F/W upgrade	Y	7.3.94.4
TR-064	Y	7.3.94.4
TR-069	Y	7.3.94.4
TR-098	Y	7.3.94.4
TR-111	Y	7.3.94.4
TR-143 (Download, Upload, UDPEcho)	Y	7.3.94.4
SNMP v1/v2c /v3, IPv4/IPv6	Y	7.3.94.4
Web Page/X-Modem/FTP/TFTP Firmware upgrade	Y	7.3.94.4
Diagnostic Tool for ADSL and IP Ping	Y	7.3.94.4
2 user accounts support	Y	7.3.94.4
Setup Wizard	Y	7.3.94.4
Others		
USB 2.0 Host App	Y	7.3.94.4
Storage	Y	7.3.94.4
Web Camera	Y	7.3.94.4
3G dongle	Y	7.3.94.4
Printer server	Y	7.3.94.4
HWNAT	Y	7.3.94.4
DMS	Y	7.3.94.4
Parent Control	Y	7.3.94.4
SAMBA	Y	7.3.94.4
Multi-language webpage	Y	7.3.94.4
IPoE 8021X	Y	7.3.94.4
MultiService on wan	Y	7.3.94.4
NAND Flash Support	Y	7.3.94.4

5 Toolchain Installation

The MediaTek 7510 SDK Release demands the toolchain are recommended to preassembled:

1) Platform MT7510: mips-linux-uclibc
   A. Enter “mkdir –p /opt/trendchip” to create a toolchain folder.
   B. Enter “cp toolchain/mips-linux-uclibc.tgz /opt/trendchip” to copy compressed toolchain binary to folder.
   C. Enter “tar jxvf mips-linux-uclibc.tgz” to decompress the toolchain binary.
   D. Enter “export PATH=/opt/trendchip/mips-linux-uclibc/usr/bin:$PATH” to add toolchain path to Environment Variable path

6 Fakeroot Installation

Fakeroot provides a fake root environment so as you can install and build SDK like root user. You can follow the steps to install fakeroot

1) Decompress SDK
2) Make directory of “releasebsp” and copy the SDK file into this folder (the “releasebsp” represents location that you extract the SDK package to, the following the same),for instance, “mkdir –p ~/releasebsp” ; “cp releasebsp_profilename_releasedate.tgz ~/releasebsp”“ tar -xzvf releasebsp_profilename_releasedate.tgz ”
3) Enter releasebsp/tools/fakeroot folder
4) ./configure & make;
5) After make process finished, Enter “fakeroot” to change the “$” to “#”, if you can still not find the fakeroot command, please enter “sudo make install” , or add fakeroot path to your execution path,ex: Enter “export PATH=[absolute path of releasebsp location]/tools/fakeroot/scripts:$PATH” .
6) execute “whoami” to confirm that you are “root” user, and build firmware with procedure mentioned behind(7 Building Software).
7) Input “exit” after buildimage to shift as regular user, and the identifier should change from “#” to “$”

7 Building Software

1) Decompress SDK
   (If you have uncompressed SDK in part 6, please ignore this step)
   Make directory of “releasebsp” and copy the SDK file into this folder (the “releasebsp” represents location that you extract the SDK package to, the following the same),for instance, “mkdir –p ~/releasebsp” ; “cp releasebsp_profilename_releasedate.tgz ~/releasebsp”“ tar -xzvf releasebsp_profilename_releasedate.tgz ”

2) Create Profile
   a. Change to dir“releasebsp/Project/profile” , create a folder and an empty file under this folder with the same name. For instance, “mkdir test & touch test/test.profile ”
   b. Change to dir “releasebsp/” , configure your target profile with “make PROFILE=[profile to be configure] KERNEL_2_6_36=1 menuconfig”. For instance, “make PROFILE=test KERNEL_2_6_36=1 menuconfig”
3) Build Image
   Change to dir “releasebsp/” ,clean with “make PROFILE=test clean” and build with “make PROFILE=test KERNEL_2_6_36=1”. Firmware of “tcboot.bin”, “tclinux.bin” , “tclinux_allinone” and “tclinux_allinone.swap” will be generated under “releasebsp/ Project/images”

You can refer to the MediaTekLinuxDeveloperGuide.pdf to learn more about the process of compiling.

8 Firmware Upgrade

You can upgrade firmware through 4 methods, including tftp, ftp, webpage and xmdm. Before explain of these 4 methods, we will introduce “bootloader mode” firstly.

If you want to upgrade bootloader firstly on your CPE, you can refer to Method (1) to upload tcboot.bin firstly. After that, power on the CPE and press any key in 3 seconds to enter bootloader mode.

Commands in bootloader mode is as following:

- go decompress the inmage and boot system
- memrl read a word from specified memory address
- memwl write a word to specified memory address
- dump dump memory infor with specified length bytes
- jump jump to specified address and execute
- flash Program the flash with specified memory range and length.
- miir mii read ethernet phy register
- miiw mii write ethernet phy register
- ipaddr change CPE's IP address
- sys mac <mac_addr> change CPE's mac address
- xmdm Upload firmware via xmodem. This is the 4th upgrading method mentioned above.

1. Upgrade tclinux.bin or tcboot.bin through tftp method
   - Prepare a client PC and make sure the client PC successfully connected to CPE via Ethernet cable and serial port line.(the client PC may need be manually set with ip of 192.168.1.*)
   - Power on CPE and press anykey in 3 seconds to enter bootloader mode.
   - open a cmd window on client PC and enter“tftp -i 192.168.1.1 put [absolute path of tclinux.bin or tcboot.bin]” to upload firmware
   - It strongly recommend that bootbase extend to 128K option have to be enabled.
     - The approach to upgrade firmware is as folloing
       - Wait for few minutes writing the image into flash automatically or enter command of “flash [30000 if update tclinux.bin or 20000 if tcboot.bin] 80020000 [hex lenth of tclinux.bin or tcboot.bin]” in serial console
   - Otherwise..
     - Wait for few minutes writing the image into flash automatically or enter command of “flash [20000 if update tclinu.bin or 10000 if tcboo.bin] 80020000 [hex lenth of tclinux.bin or tcboot.bin]” in serial console
   - If your are upgrading tclinux.bin pleaseinput “go” to boot the system, and if you are upgrading tcboot.bin please restart CPE...

   Tips: the default buffer address for tftp is 0x80020000.

2. Upgrade firmware through webpage
   - Enter “ifconfig br0 192.168.1.1” to set the CPE’s IP 192.168.1.1. Please make sure the CPE and PC is in the same subnet.
   - Input “http://192.168.1.1” into URL field in web browser after CPE boot up successfully.
   - Login webpage with Account ”admin” And Password “1234”
   - Select Maintenance-> Firmware, find the new firmware location and “Upgrade”
   - Wait for several minutes to reboot the system.

3. Upgrade the firmware through FTP
   - Enter “ftp 192.168.1.1” in Windows command mode after system boot up successfully.
   - Connect Client PC with CPE with ether cable after CPE power up
   - Open cmd window on client PC and execute “ftp 192.168.1.1” to connect to ftp server on CPE
   - Login ftp with Account ”admin” And Password “1234”
   - Enter “bin” to enable binary transfer mode.
   - Enter “put tclinux.bin” to upload the firmware.

9 Load BSP Drivers and Applications

9.1 BSP Drivers

You can use the following command to load the BSP drivers into system.

- SAR

insmod /lib/modules/mtk_sar/mt7510sar.ko

- RAETH(Mt7510)

insmod /lib/modules/raeth.ko

- HWNAT

insmod /lib/modules/hwnat.ko

- ADSL/VDSL

insmod /lib/modules/dmt/mt7510/tc3162_dmt_mt7510.ko

- PTM

insmod /lib/modules/private/mt7510_ptm/mt7510ptm.ko

- USB 2.0 Host for Storage

insmod /lib/modules/usb_host/usbcore.ko
insmod /lib/modules/usb_host/ohci-hcd.ko
insmod /lib/modules/usb_host/ehci-hcd.ko
insmod /lib/modules/usb_host/scsi_mod.ko
insmod /lib/modules/usb_host/scsi_wait_scan.ko
insmod /lib/modules/usb_host/sd_mod.ko
insmod /lib/modules/usb_host/usb-storage.ko
insmod /lib/modules/usb_host/nls_base.ko
insmod /lib/modules/usb_host/nls_ascii.ko
insmod /lib/modules/usb_host/nls_cp437.ko
insmod /lib/modules/usb_host/fat.ko
insmod /lib/modules/usb_host/msdos.ko
insmod /lib/modules/usb_host/vfat.ko

After successfully insert modules above , usb storage device can be attached to CPE.

- Enter "cat /proc/partitions" to see the major and minor number of the storage partitions
- Enter "mknod" to create the device file.
- Enter "mount" to mount the storage partition on the system.

For example:

cat /proc/partitions ------> you will see "8 0 64000 sda"
mknod /tmp/sda b 8 0
mount /tmp/sda /tmp/var -t vfat ------>mount sda at /tmp/var.

9.2 Applications

1) SINGLE RFC1483 BRIDGE PVC

- We use br2684ctl to create a PVC.

- br2684ctl command usage is as the following
  br2684ctl [-b] [[-c number] [-e 0|1] [-t ubr|cbr|vbr] [-p pcr] [-q scr] [-m mbs] [-a [itf.]vpi.vci]*]*

  -t ubr|cbr|vbr: -t specify ATM QoS class, default is UBR
  -p pcr: specify PCR cell rate
  -q scr: specify SCR cell rate
  -m mbs: specify MBS

  -e 0 = Bridged LLC encapsulation
  -e 1 = Bridged VC-Mux encapsulation
  -e 2 = Routed LLC encapsulation
  -e 3 = Routed VC-Mux encapsulation

- Enter “br2684ctl -c 0 -a 0.0.33 &” to create a PVC with VPI=0 and VCI=33: It will create a nas0 interface, 0 is specified in -c argument. Default ATM QoS class is UBR.
- Enter “ifconfig nas0 0.0.0.0” to make interfaces up.
- Enter “brctl addif br0 nas0” to add WAN interface nas0 to bridge interface br0

2) MULTIPLE RFC1483 BRIDGE PVCS

You can follow the following steps to create multiple PVCs.

- Enter “br2684ctl -c 0 -a 0.0.33 &” to create a PVC with VPI=0 and VCI=33: It will create a nas0 interface, 0 is specified in -c argument. Default ATM QoS class is UBR.
- Enter “br2684ctl -c 1 -t cbr -p 500 -a 0.0.34 &” to create another PVC with VPI=0, VCI=34 and QoS type is CBR and PCR is 500cells/s. Then you will get a nas1 interface.
- Enter “ifconfig nas0 0.0.0.0” to make nas0 interfaces up.
- Enter “ifconfig nas1 0.0.0.0” to make nas1 interfaces up.
- Enter “brctl addif br0 nas0” to add ethernet interface eth0 and WAN interface nas0 to br0.
- Enter “brctl addif br0 nas1” to add ethernet interface eth0 and WAN interface nas1 to br0.

3) RFC1483 ROUTING MODE

You can follow the following steps to create RFC1483 routing mode.

- Enter “br2684ctl -c 0 -e 2 -a 0.0.33&” to create a RFC1483 routing mode PVC with VPI=0 and VCI=33
- Enter “ifconfig nas0 10.0.0.1 netmask 255.0.0.0 pointopoint 10.0.0.254” to set ip address and netmask of nas0 interface.
- Enter “echo 1 > /proc/sys/net/ipv4/ip_forward” to enable ip routing.
- Enter “route add default dev nas0” to add default route.

4) PPPoA

You can follow the following steps to create PPPoA connection.

- Enter “wan adsl status” to check the ADSL link.
- Enter “echo 1 > /proc/sys/net/ipv4/ip_forward” to enable ip routing after ADSL link up.
- Enter “pppd unit 0 user 1 password 1 nodetach holdoff 4 maxfail 25 usepeerdns lcp-echo-interval 2 lcp-echo-failure 7 defaultroute persist plugin pppoa llc-encaps 0.33 &” to make PPPoA dialing with username=1, password=1, LLC encaps, VPI=0 and VCI=33.

5) PPPoE

You can follow the following steps to create PPPoE connection.

- Enter “wan adsl status” to check the ADSL link.
- Enter “br2684ctl -c 0 -a 0.0.33 &” to create a PVC with VPI=0 and VCI=33 after ADSL link up.
  It will create a nas0 interface, 0 is specified in -c argument. Default ATM QoS class is UBR.
- Enter “ifconfig nas0 0.0.0.0” to make interfaces up.
- Enter “echo 1 > /proc/sys/net/ipv4/ip_forward” to enable ip routing.
- Enter “pppd unit 0 user 1 password 1 nodetach holdoff 4 maxfail 25 usepeerdns lcp-echo-interval 2 lcp-echo-failure 7 defaultroute persist plugin pppoe nas0 &” to make PPPoE dialing with with username=1, password=1, LLC encaps, VPI=0 and VCI=33.

6) ENABLE NAT

You can follow the following steps to enable NAT.

- Enter “iptables -t nat -A POSTROUTING -o ppp0 -j MASQUERADE” to make ppp0 as NAT interface after PPP connection establish successfully.
- Enter “iptables -A FORWARD -p tcp --tcp-flags SYN,RST SYN -j TCPMSS --clamp-mss-to-pmtu” to change TCP MSS for ADSL line PPP MTU is 1492.

10 Driver Interface Command Usage

You can refer to Usage Introduction in doc/CmdUsage for respective Commands , including:

- Ethernet Command
- ATM Command
- ADSL Command
- WLAN Command
- QOS Command
- Port Binding Command
- ALG Command
- Firewall Command

Tips: the following commands have been renamed with “phx” inserted:

Previous Cmds name	Current Cmds name
Wlancmd	wlanphxcmd
Ethcmd	ethphxcmd
Atmcmd	atmphxcmd
Adslcmd	adslphxcmd

11 Customer Release

You can follow the steps below to release SDK to your customer:

1. Enter “tar -zxvf releasebsp_profilename_releasedate.tgz” to decompress the release BSP package to “releasebsp” folder
2. Enter “releasebsp” folder
3. Enter “make CUSTOMERRELEASE=y KERNEL_2_6_36=1” or “make PROFILE=XXX CUSTOMERRELEASE=y KERNEL_2_6_36=1” (select your own profile name of XXX)
4. Enter “releasebsp” folder and Enter ”make PROFILE=xxx clean”
5. Enter “make PROFILE=xxx KERNEL_2_6_36=1”
6. You can get “tcboot.bin”, “tclinux.bin” , “tclinux_allinone” and “tclinux_allinone.swap” files in “Project/images” folder

12 The Source Code Directory

The main folders in SDK is as following,

- /linux-2.6.36
  This directory contains the Linux kernel source code
  • /linux/arch/mips/trendchip/tc3162
  Specifically, this directory contains hardware initialization code for MIPS processor capabilities, SDRAM size, MIPS timer and interrupts.
- /bootrom
  This directory contains bootloader source and binary code.
- /project
  This directory contains profile and configure file for Project Setup and firmware build.
- /modules
  This directory contains public and private driver module files.
- /filesystem
  This directory contains files and folders for rootfs of tclinux system.
- /apps
  This directory contains applications public source code, private source code and binary code.

12.1 The Modules Source Code Directory

PUBLIC:

The modules' source code under this directory and subdirectories is from "Open Source". Some of the files contain modification made by MediaTek. All these files can be made available in the source code format.

1) usb_camera
   - This directory contains driver for usb driver

PRIVATE:

The modules' source code under this directory and subdirectories was developed by MediaTek . Some of the files will be released as source code while the others can not be released in the source code format although these modules can be made available in the object format.

1) dmt
   - This directory contains a collection of driver for Discrete Multi-Tone module
2) ko
   - This directory contains the modules implementation in object format
3) raeth
   - This directory contains frame engine driver
4) tc3162l2hp2h
   - This directory contains old SAR driver for all platforms, MAC driver
5) tcci

- This directory contains xDSL and system cmd implementation

6) tcphy
   - This directory contains driver for switch
7) wifi
   - This directory contains driver for WiFi module
8) bufmgr
   - This directory contains driver for QDMA

12.2 The APPs Source Code Directory

Binary:

The applications' source code under this directory and subdirectories was developed by MediaTek and can not be released in the source code format although the applications and modules can be required to be made available in object format

1) Mt7510
   - This directory contains the applications in object format for mt7510

PUBLIC:

The application source code under this directory and subdirectories is "Open Source". Some of the files contain modification made by MediaTek. All these files can be made available in the source code format.

Tips The related reference can be found in doc/manual/MediaTek_Linux_SW_BOM.xls

1) 8021X
   - This directory contains 802.1x implementation
2) avahi-0.6.28
   - This directory contains implementation for multicast DNS/DNS-SD service discovery
3) bftpd
   - This directory contains FTP server application
4) boa-asp
   - This directory contains boa web server
5) br2684ctl
   - This directory contains application handles RFC1483/2684 bridged PDUs.
6) bridge-utils-1.0.6
   - This directory contains utility for configuring the Bridge
7) busybox-1.00
   - This directory contains the BusyBox utility
8) cpu
   - This directory contains cpu diagnostic utility
9) dhcp-isc
   - This directory contains DHCP implementation
10) dnsmasq-2.52
   - This directory contains application provide DNS service
11) dproxy-nexgen
   - This directory contains caching name server(DNS)
12) dropbear-0.52

- This directory contains SSH2 server and client

13) ebtables-v2.0.8-2
- This directory contains MAC layer packet filtering and manipulating support function

14) ecmh-2005.02.09
- This directory contains a network daemon that acts as a full IPv6 MLDv1 and MLDv2 Multicast “Router”

15) ez-ipupdate-3.0.10
- This directory contains utility for updating your host name IP for any of the dynamic DNS service.

16) flex-2.5.35
- This directory contains the fast lexical analyzer generator

17) ftpd
- This directory contains the bftpd ftp server

18) igd
- This directory contains upnpd application

19) igmpproxy
- This directory contains dynamic Multicast Routing Daemon using only IGMP signaling

20) iproute
- This directory contains a collection of utilities for controlling TCP and UDP IP networking and traffic

21) iproute2-2.6.22-070710
- This directory contains a collection of utilities for controlling TCP and UDP IP networking and traffic.

22) iptables-1.3.8
- This directory contains IP layer packet filtering, Network Address/Port Translation support

23) inetd
- This directory contains daemon that manage Internet services.

24) jpeg-6b
- This directory contains JPEG image compression and decompression utility.

25) lib
- This directory contains library for applications

26) libdaemon-0.14
- This directory contains library that eases the writing of the daemons

27) libosip2-2.0.4
- This directory contains library for oSIP(an implementation of SIP)

28) linux-atm
- This directory contains drivers and tools for ATM

29) matrixssl-1-8
- This directory contains open embedded SSL and TLS implementation

30) mjpg-streamer-r63
- This directory contains utility that takes JPGs from Linux-UVC compatible webcams, file systems or other input plugins and streams them as M-JPEG via HTTP to web browser.

31) mtd
- This directory contains driver for Memory Technology Device

32) mxml-2.4
- This directory contains minimumXML library C language implementation.

33) net-snmp-5.3.1
- This directory contains a simple SNMP implementation

34) ntfs-3g-2010.5.22
- This directory contains driver for NTFS

35) ntpclient
- This directory contains NTP client for CPE

36) openssl-1.0.0d
- This directory contains the openssl library

37) p910nd-0.93
- This directory contains a small printer daemon intended for CPE

38) ppp-2.4.5
- This directory contains ppp implementation

39) quagga-0.98.6
- This directory contains a routing software suite providing implementation of OSPFv2, OSPFv3,RIP v1 and RIP v2, RIPng and BGP-4.

40) radvd-1.5
- This directory contains IPv6 Router Advertisement Daemon

41) rp-pppoe-3.10
- This directory contains implementation of PPPoE

42) samba-3.0.2
- This directory contains samba server implementation

43) siproxd-0.5.12
- This directory contains proxy/masquering daemon for SIP protocol

44) tftp-1.0
- This directory contains tftp server application

45) tools
- This directory contains several tools for CPE

46) traceroute-2.0.17
- This directory contains network diagnostic tool for displaying the route(path) and measuring transit delays of packets.

47) utelnetd-0.1.2
- This directory contains a small and efficient stand alone telnet server daemon

48) vlan
- This directory contains implementation for virtual lan

49) wide-dhcpv6-20080615
- This directory contains DHCPv6 implementation

50) wireless_tools.28
- This directory contains a set of tools allowing to manipulate the wireless extensions.

51) wpa_supplicant-0.7.3
- This directory contains daemon for WPA supplicant.

52) zebra-0.93a

- This directory contains RIP application

PRIVATE:

The application source code under this directory and subdirectories was developed by MediaTek . Some of the files will be released as source code while the others can not be released in the source code format although these applications can be made available in the object format.

1) cfg_manager
   - This directory contains configure manager utility
2) cmd_ci
   - This directory contains commands' implementation of CPE cmds
3) etc_script
   - This directory contains scripts used by CPE
4) ethcmd
   - This directory contains command implementation of ether
5) led_conf
   - This directory contains LED related configure file for CPE
6) lib
   - This directory contains library for some applications
7) sendicmp
   - This directory contains implementation of ping
8) tcapi_lib
   - This directory contains tcapi(API used by MediaTek CPE) library
9) tcci
   - This directory contains XDSL command implementation
10) tclinux_builder
    - This directory contains scripts and tools for firmware building
11) TR69_64
    - This directory contains DSL Forum TR-69 Wan management protocol CPE side implementation and TR-64 Lan management protocol CPE side implementation
12) webpage
    - This directory contains webpage related files for CPE

12.3 Additional documents included in this release

The additional documents locate under the /**doc** directory. The doc directory contains two subdirectories, **MANUAL** and **SOP**(short for **S**tandard **O**peration **P**rocedure). The MANUAL mainly includes CPE configuring and using material. The SOP mainly focuses on developing reference based on this SDK.

1.Under MANUAL: ----------Instruction and reference for CPE

MediaTek_Reference_for_WiFi_Driver_Efuse_Buffermode.pdf----------Efuse/buffer mode configuration
MediaTek_Feature_List_In_Menuconfig.xls.pdf----------Reference of feature in menu-config
MediaTek_Linux_SPI_FLash_Support_List.pdf ---------- Supported SPI flash list
MediaTek_User_Manual_for_USB_Camera_3gDongle_Printer.pdf---------- Instruction of USB utility
1.1 CmdUsage: ---------- reference of command usage
ADSL_PHX_CMD.pdf---------- reference of adslphxcmd usage
ALG_SWITCH_CMD.pdf---------- ----------reference of switch cmd usage
ATM_PHX_CMD.pdf---------- reference of atmphxcmd usage
ETHER_PHX_CMD.pdf---------- reference of ethphxcmd usage
FIREWALL_CMD.pdf---------- reference of firewall cmd usage
PORT_BINDING_CMD.pdf----------reference of portbind cmd usage
QOS_CMD.pdf---------- ----------reference of QoS cmd usage
WLAN_PHX_CMD.pdf---------- reference of wlanphxcmd usage

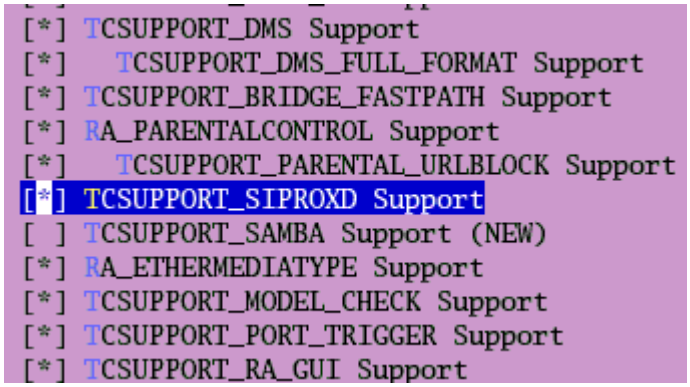
2. Under SOP:

---------- Standard Operation Procedure(SOP) for Developer
MediaTek_Linux_Developer_Guide.pdf---------- Developer's guide for the SDK
MediaTek_Linux_SW_BOM.pdf ----------Reference of open source projects in SDK
MediaTek_Mechanism_for_TR069_Parameter.pdf---------- How to add new parameters for TR69
MediaTek_SOP_for_New_Flash_Support_Linux.pdf ----------How to support new flash on CPE
MediaTek_Web_Page_Programming_Reference.pdf --------Guide for webpage programming on CPE

13 Appendix

13.1 Compile notes

As compliing siproxd module, it will need the automake with version 1.6.3. This module is enable defaultly and used to resolve the SIP NAT-traversal issue. Please replace the automake to automake-1.6.3 if enabling this module. It could be enabled/disabled in the common feature setting of menuconfig.



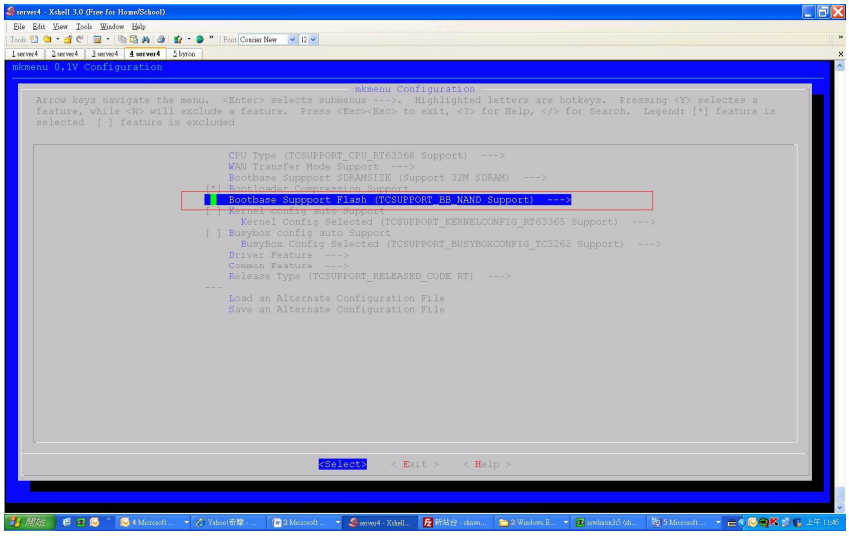
13.2 How to Enable NAND flash Support

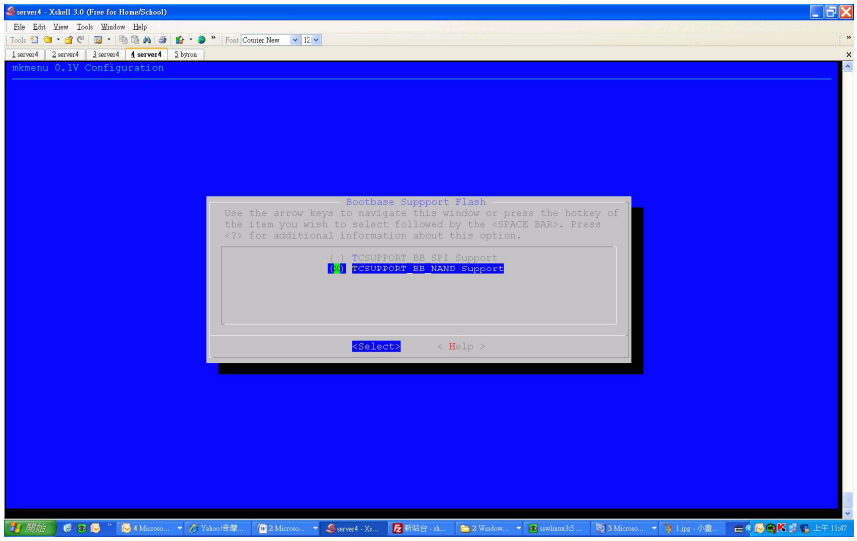
1.Enter “sudo make PROFILE=mt7510_demo KERNEL_2_6_36=1 menuconfig”

2.Choose boot from SPI or NAND flash.

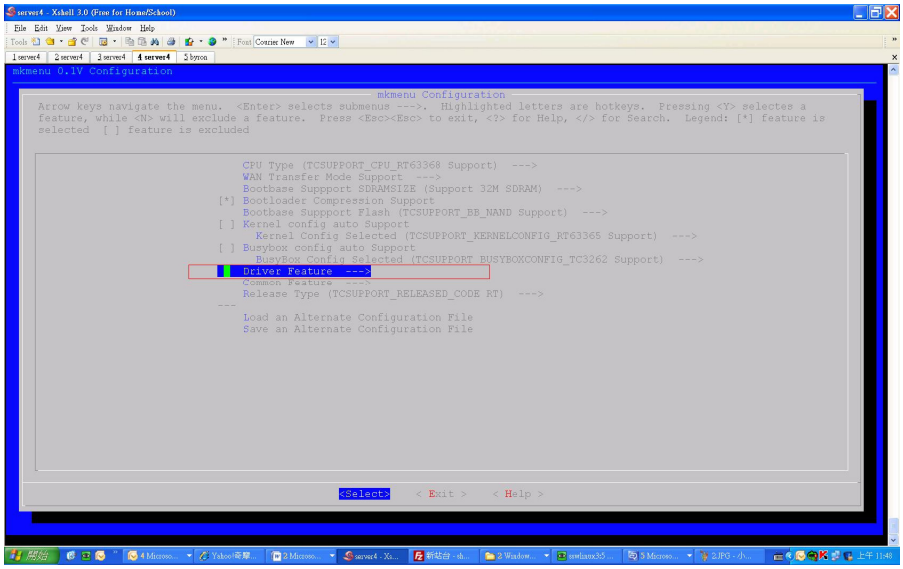
TCSUPPORT_BB_SPI_Support : Boot from SPI flash

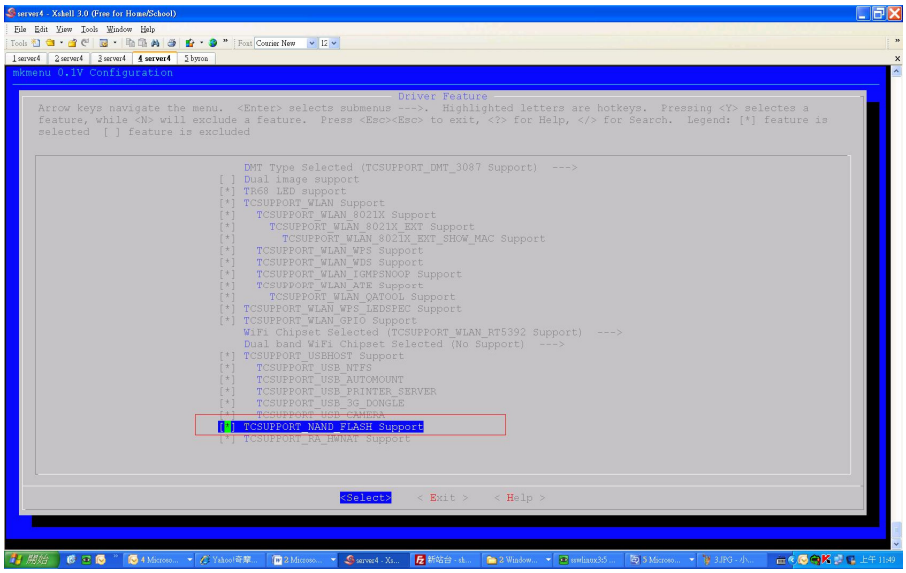
TCSUPPORT_BB_NAND_Support : Boot from NAND flash





3.Enable NAND flash support in kernel.

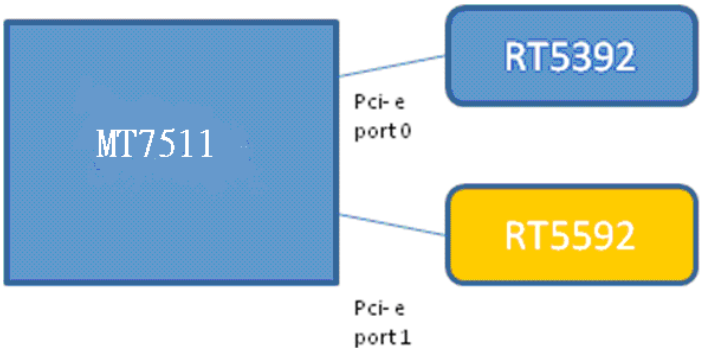




4.rebuild your firmware.

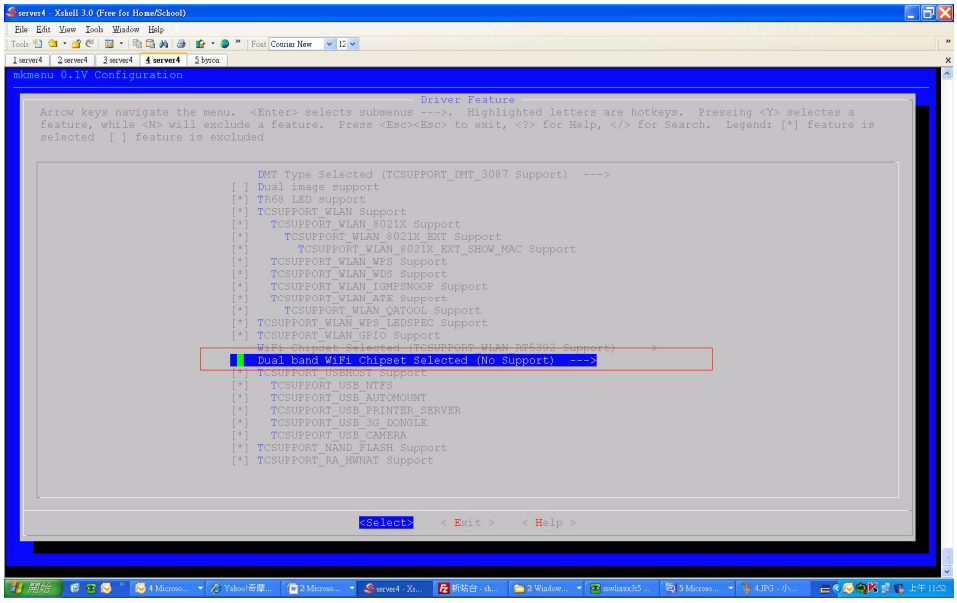
13.3 How to Enable Wifi Dual Band Concurrent Support

Only 7511 high-end network processor has two PCI-E interfaces and user can use these two interfaces to run dual band concurrent. We use rt5392 to port 0 by default. We will use RT5592 to port 1 when user enable dual band support.

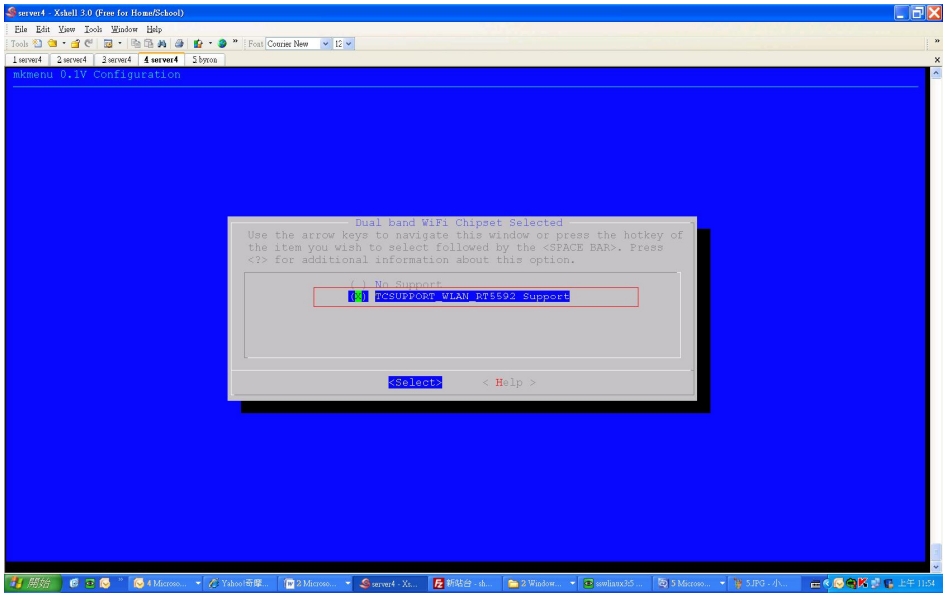


User need do step by step to enable Dual Band Concurrent Support..

1. Enter “sudo make PROFILE=mt7510_demo KERNEL_2_6_36=1 menuconfig” and choose “Dual Band Wifi Chipset select”

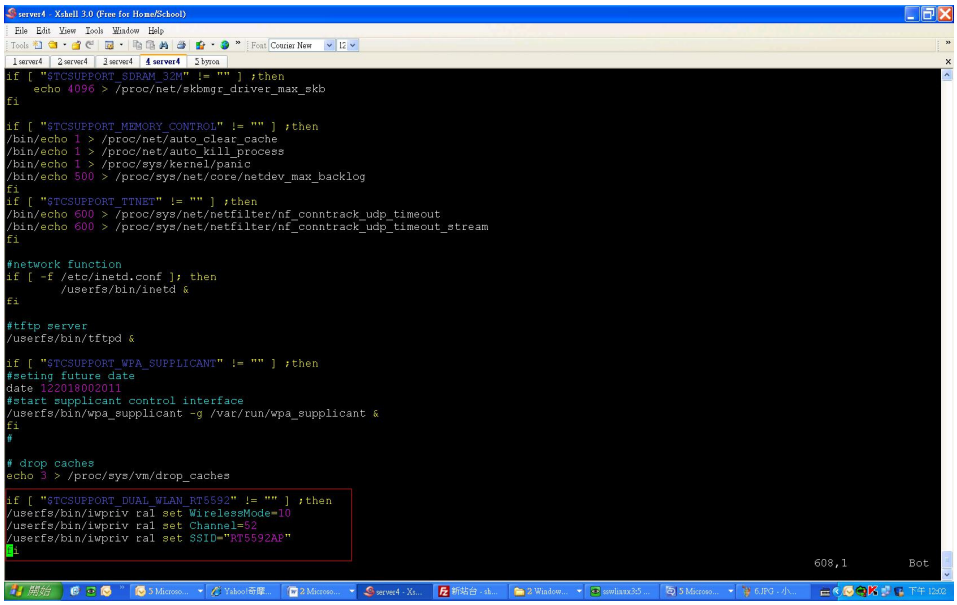


2.Choose “TCSUPPORT_WLAN_RT5592_SUPPORT”



3.RT5592 will default in agn mode(WirelessMode 10) and Channel is 52.

We set the RT5592 parameter in filesystem/usr/etc/init.d/rcS and user can use iwpriv to change settings.



4. rebuild your firmware.

NOTE: Please do not put this firmware to our RFB after enable this feature, because our RFB has only one PCI-E port. Otherwise CPE will hang when PCI-E initiation.

13.4 How to Configure LED using new method

Bi-color light support new configuration method to support from GPIO32 to GPIO63,example as follow:

See GPIO column in led.conf, the old configuration method is 32(means GPIO3 and GPIO2),the new configuration method is 3205(means GPIO50 and GPIO5)

Note:

1. Config gpio using hex, and new configuration method is compatible with old configuration method.
2. If number of gpio is greater than 15,must use new configuration method.