

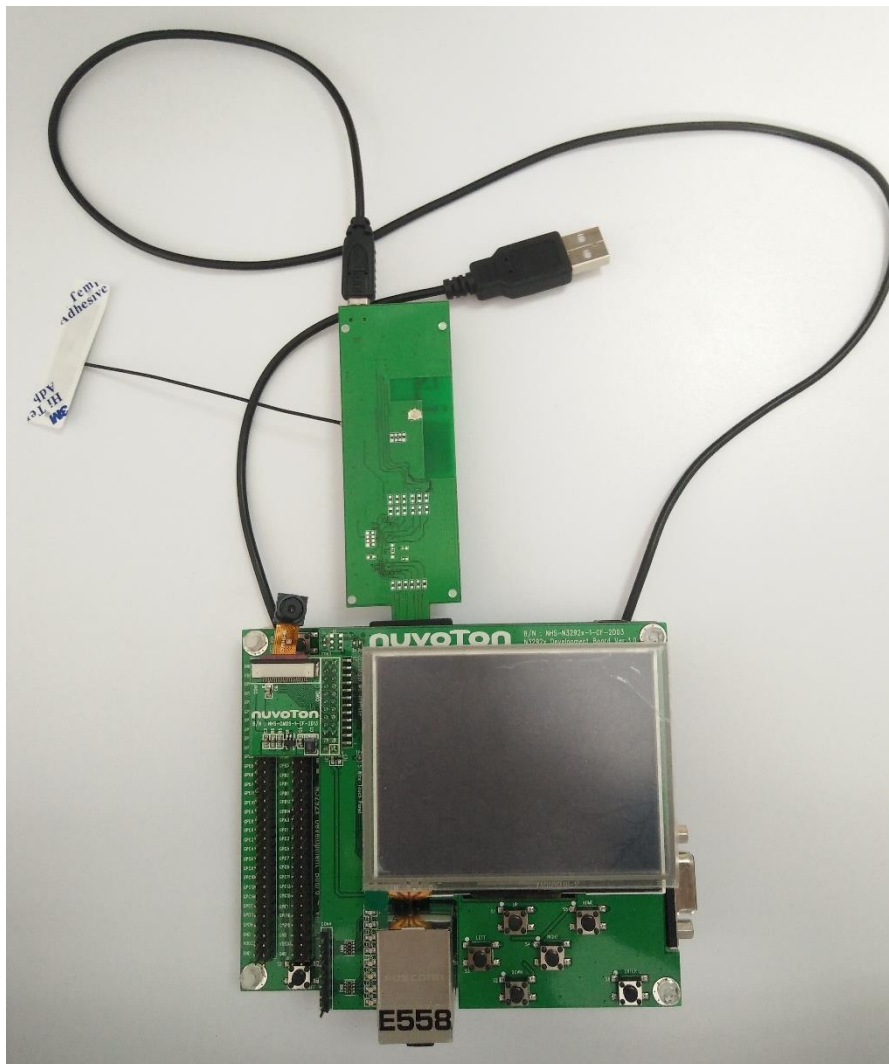
Video Over WiFi Application Note

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9/21/2016

Evaluation platforms

- **SD-WB61S-DevKit:** Amp'ed RF WiFi development kit with SDIO interface. Contains WB61S-EXT combo module.
- **N3292x Development Platform Ver:3.0:** Nuvoton development kit for ND-N32926 Video MCU.



1. Demo platform setup

- a. Prepare the Nuvoton platform as below.
Connect the PC to the Nuvoton EVB via serial port as marked No. 6 in figure 1.

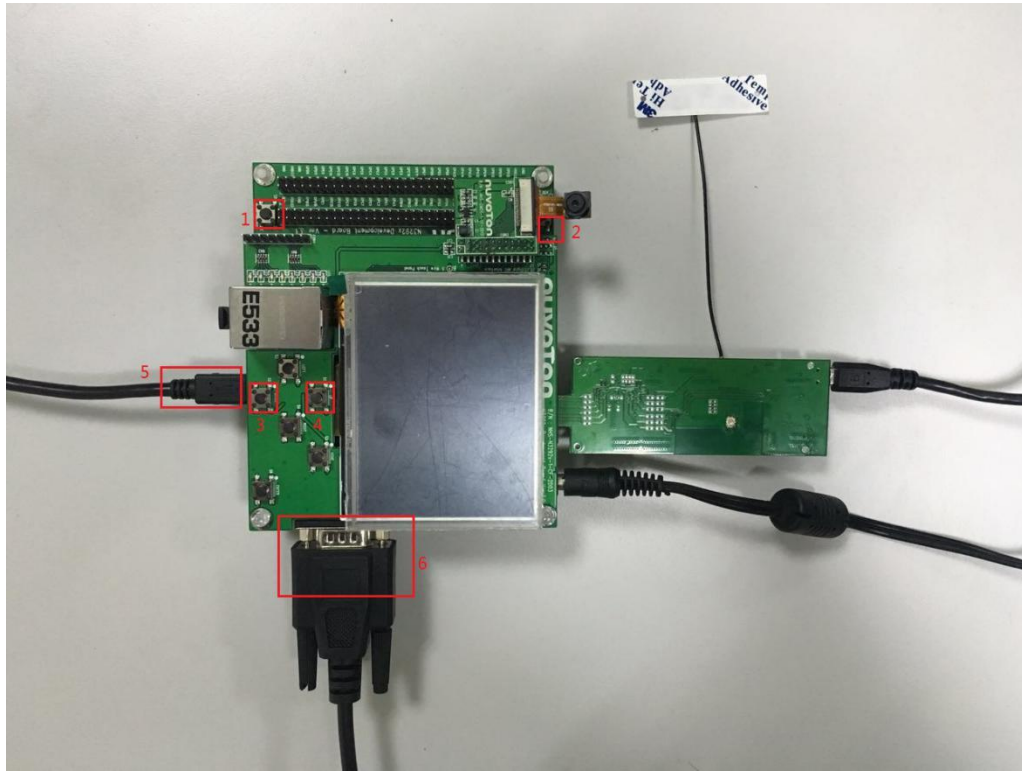


Figure 1

- b. Insert the SD adapter into the Nuvoton EVB as shown above. And power it with USB(micro USB) external cable as in figure 2.

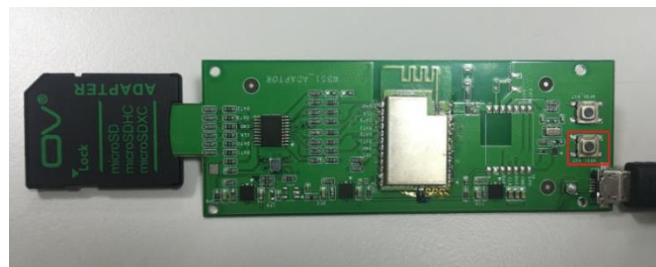


Figure 2

- c. Connect Nuvoton EVB to the PC via mini USB cable as marked No. 5 in figure 1.
- d. Press the power button(button 1) to get Nuvoton EVB powered on.
- e. After several seconds, press the reset button (button 2) first, then press button 3 and 4 simultaneously (see figure 1). The serial port display is shown below:

```

Serial-COM3 - SecureCRT
Serial-COM3
Write - 0x8000301c = 0x00002402
Delay 256 us
Write - 0x80003004 = 0x00000020
Delay 256 us
Write - 0x80003054 = 0x00000013
Delay 4096 us
Write - 0x80003054 = 0x0000001E
Delay 20480 us
DRAM CMD0
Delay 4096 us
DRAM CMD2
DRAM CMD2
Write - 0x80003054 = 0x0000001A
Delay 8192 us
Write - 0x80000208 = 0x00008354
Write - 0x80000204 = 0x00E5011F
Success
Execute Address 0x00900000
W55FA92 Nand Boot Loader entry (20150624).
0
H
01111113.Ap3:
System Clock = 240,000,000Hz
DRAM clock = 360,000,000Hz
REG_SDTIME = 0x2ABF394A
Enable RTC power off feature to 6 seconds.
Get image information from block 0x0...
Load File length 153,600, execute address 0x500000
Load File length 244,104, execute address 0x800000
Nand Boot Loader exit. Jump to execute address 0x800000 ...
NVT Loader Start
PWRON = 0x60085
NR, NF, NO = 2, 160, 4
NVT Loader: g_ibr_boot_sd_port = 0
N3292 UDC Library (20140926)
NR, NF, NO = 2, 160, 4
[GNAND] GNAND Library Version: V1.02.5
Initial NAND NonOS Driver (20141230) for NAND port 0
NAND: Found SLC NAND, ID [EF][F1][80][95][00], page size 2,048, BCH T8
UIBRAreaSize = 4 blocks
[GNAND] NAND flash chip detected, chip ID is 0xEF-0xF1 !
Total Disk Size 125,056 KB
KPI Key Code = 0x30
Enter USB
Detect USB plug in
<MSC>
N3292 MSC Library (20150123)
  
```

Figure 3

- f. Note that a new hardware device will be enumerated onto the PC:

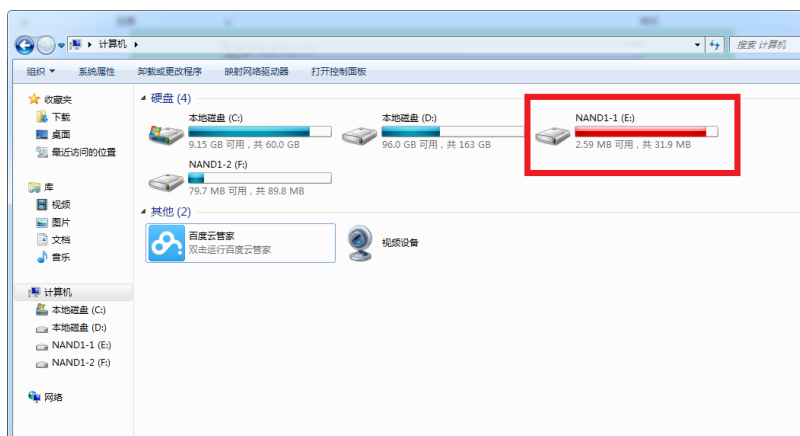


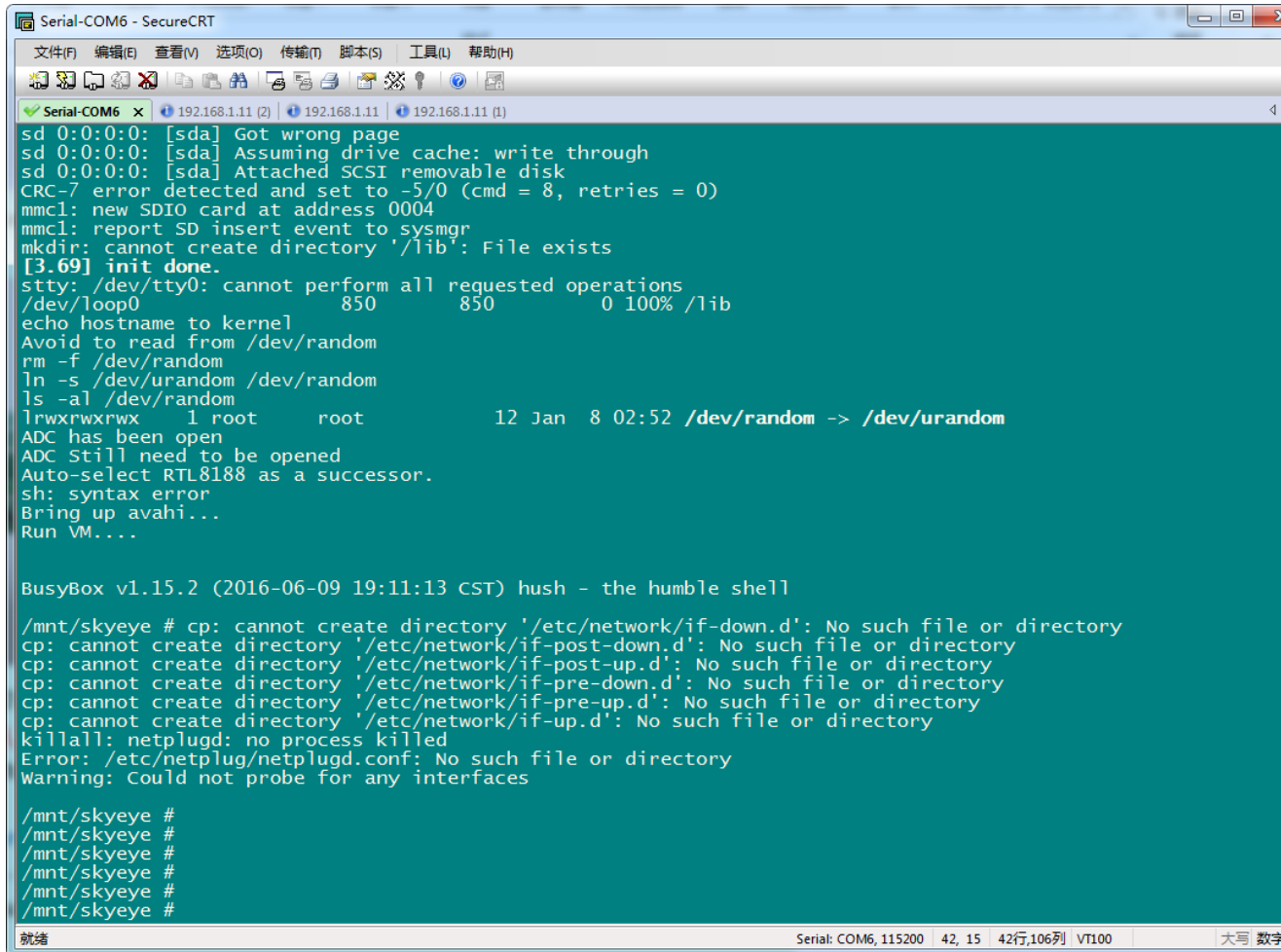
Figure 4

- g. Copy the files *cfg80211.ko*, *compat.ko*, *conprog.bin*, *cw1200_drv.ko*, *mac80211.ko* to folder "nand1-1" on Nuvoton EVB.
- h. Note that mini USB cable as marked No.5 in figure 1 is not necessary in the

following test.

2. Start the Demo

- a. Press the button shown in figure 6 to reset the WB61S WiFi module. Press Button 2 in figure 2 to reset Nuvoton EVB. (Make sure WB61S WiFi module reset before Nuvoton EVB starts up.)



```

Serial-COM6 - SecureCRT
文件(F) 编辑(E) 查看(V) 选项(O) 传输(T) 脚本(S) 工具(U) 帮助(H)
Serial-COM6 x 192.168.1.11 (2) 192.168.1.11 192.168.1.11 (1)
sd 0:0:0:0: [sda] Got wrong page
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] Attached SCSI removable disk
CRC-7 error detected and set to -5/0 (cmd = 8, retries = 0)
mmc1: new SDIO card at address 0004
mmc1: report SD insert event to sysmgr
mkdir: cannot create directory '/lib': File exists
[3.69] init done.
stty: /dev/tty0: cannot perform all requested operations
/dev/loop0 850 850 0 100% /lib
echo hostname to kernel
Avoid to read from /dev/random
rm -f /dev/random
ln -s /dev/urandom /dev/random
ls -al /dev/random
lrwxrwxrwx 1 root root 12 Jan 8 02:52 /dev/random -> /dev/urandom
ADC has been open
ADC Still need to be opened
Auto-select RTL8188 as a successor.
sh: syntax error
Bring up avahi...
Run VM....

BusyBox v1.15.2 (2016-06-09 19:11:13 CST) hush - the humble shell

/mnt/skyeye # cp: cannot create directory '/etc/network/if-down.d': No such file or directory
cp: cannot create directory '/etc/network/if-post-down.d': No such file or directory
cp: cannot create directory '/etc/network/if-post-up.d': No such file or directory
cp: cannot create directory '/etc/network/if-pre-down.d': No such file or directory
cp: cannot create directory '/etc/network/if-pre-up.d': No such file or directory
cp: cannot create directory '/etc/network/if-up.d': No such file or directory
killall: netplugd: no process killed
Error: /etc/netplug/netplugd.conf: No such file or directory
Warning: Could not probe for any interfaces

/mnt/skyeye #
/mnt/skyeye #
/mnt/skyeye #
/mnt/skyeye #
/mnt/skyeye #
/mnt/skyeye #
  
```

Figure 5

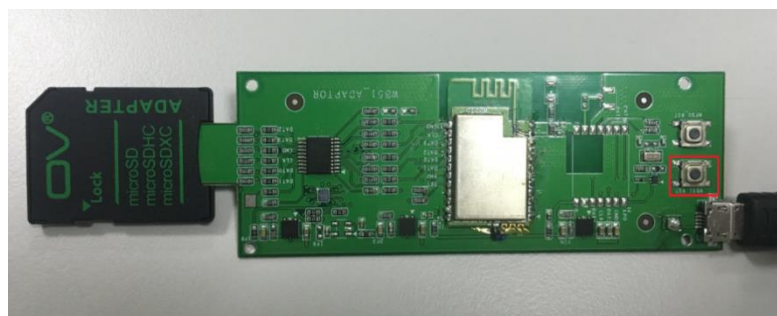


Figure 6

- b. Install kernel modules.

Change the working path to “/mnt/nand1-1” and execute the following commands on the console window:

```
cd /mnt/nand1-1  
insmod compat.ko  
insmod cfg80211.ko  
insmod mac80211.ko  
insmod cw1200_drv.ko
```

- c. Enable the wireless interface “wlan0” with this command:

```
ifconfig wlan0 up
```

- d. Connect to the router with “wpa_supplicant” tool.

First, use the default configuration file to connect to the router. Modify items “ssid” and “psk” with matching items to those of the router with an editor: such as *vi* or *vim*.

If SSID of the router is ‘Amped AP-5G’ and password is ‘12345678’, edit the file ‘wpa_supplicant_default.conf’ like as follows:

```
# request AP scanning and decide which AP to use
ap_scan=1

# enable control interface using UNIX domain sockets
ctrl_interface=/var/run/wpa_supplicant

# you can include one or more network blocks here
network={
    ssid="Amped AP-5G"
    psk="12345678"
}

- wpa_supplicant_default.conf 1/11 9%
```

Figure 7

- i. Then execute the following to connect to the router:

```
wpa_supplicant -B -iwlan0 -c ./wpa_supplicant_default.conf
```

- j. Execute the following command to confirm whether the device is connected to the router.

```
iwconfig wlan0
```

The AP mac address is obtained instead of “Not-Associated” as shown below:

```
/mnt/nand1-l/openmac #
/mnt/nand1-l/openmac #
/mnt/nand1-l/openmac # iwconfig wlan0
wlan0 IEEE 802.11abgn ESSID:"Amped AP-5G"
Mode:Managed Frequency:5.765 GHz Access Point: 80:37:73:CC:45:CF
Bit Rate=39 Mb/s Tx-Power=20 dBm
Retry long limit:7 RTS thr:off Fragment thr:off
Encryption key:off
Power Management:on
Link Quality=41/70 Signal level=-69 dBm
Rx invalid nwid:0 Rx invalid crypt:0 Rx invalid frag:0
Tx excessive retries:1 Invalid misc:0 Missed beacon:0

/mnt/nand1-l/openmac #
```

Figure 8

If it fails, the wireless encryption type of the router must be examined and the corresponding file edited.

Example:

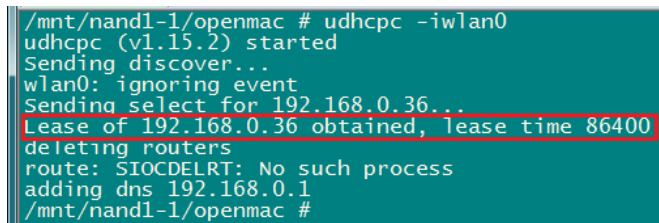
The router uses WPA-TKIP encryption, the file “wpa_supplicant_wpa_tkip.conf” should be used.

On Nuvoton EVB, edit the configuration file and then execute the below command:

```
wpa_supplicant -B -iwlan0 -c ./wpa_supplicant_wpa_tkip.conf
```

- k. Obtain an IP address with “udhcpc” tool:

```
udhcpc -iwlan0
```

A terminal window with a teal background showing the output of the 'udhcpc -iwlan0' command. The text is white, and the line 'Lease of 192.168.0.36 obtained, lease time 86400' is highlighted with a red rectangular box.

```
/mnt/nand1-1/openmac # udhcpc -iwlan0
udhcpc (v1.15.2) started
Sending discover...
wlan0: ignoring event
Sending select for 192.168.0.36...
Lease of 192.168.0.36 obtained, lease time 86400
deleting routers
route: SIOCDELRT: No such process
adding dns 192.168.0.1
/mnt/nand1-1/openmac #
```

Figure 9

- I. After an IP address is obtained successfully, use the “VLC” software of PC or phone in the same local area network with the Nuvoton board to open a network stream.

Click the ‘play’ button to start the video.

(VLC software is located here: <http://download.ampedrftech.com/utilities/>)



Figure 10