NXP Semiconductors
Quick Start Guide

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MCUXpresso SDK USB Host RNDIS & LWIP

User's Guide

1. Introduction

USB tethering feature on the cell phone could be used to get the full access to the internet. This document describes how to use the USB Host RNDIS & LWIP example provided in the MCUXpresso SDK to access the internet via a cellphone which turns on the USB tethering function.

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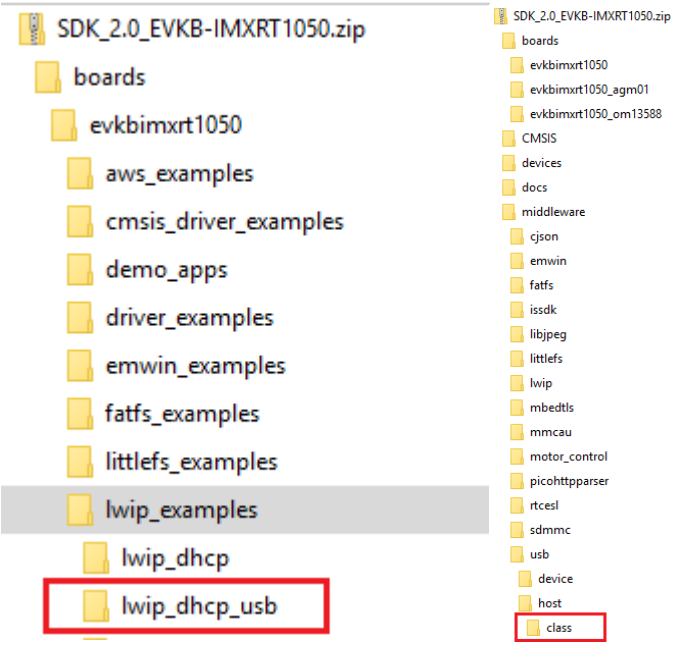
2. Software

The document will take MCUXpresso SDK2.4 evkbimxrt1050 package as example. The folder on other boards are similar to this.

2.1. Folder structure



Folder	Description
boards/ CMSIS/ devices/ docs/ middleware/ rtos/	MCUXpresso SDK2.x evkbimxrt1050 package directory.
boards/evkbimxrt1050/lwip_examples/lwip_dhcp_usb	The USB RNDIS & lwip example directory.
middleware/usb/host/class	USB RNDIS class driver
Middleware/lwip/port	USB ethernet interface driver

2.2. Features

- One example (lwip_dhcp_usb) is provided. The lwip_dhcp_usb example is a simple demonstration which integrates the USB Host RNDIS and lwIP TCP/IP stack, the example would
  - Connect to a cellphone which turns on the USB tethering feature
  - Get ip address via DHCP
  - Ping www.nxp.com
- Both BM and FreeRTOS are supported

2.3. Building the Demo

The demo projects are located in the below path.

<root>/boards/board_name/lwip_examples/lwip_dhcp_usb/<rtos>/<toolchain>.

Note: The <rtos> would be "bm" for Bare Metal or "freertos" for FreeRTOS OS.

Please refer root/docs/Getting Started with MCUXpresso SDK for xxxx(board name).pdf to know how to build the demo/download the binary to the board

3. Hardware

• Micro AB to standard A USB converter

• USB A to micro AB cable

• Personal Computer(PC)

• mobile phone with Android OS

MEIZU Note 3 – OS is Flyme 6.1.0.1M

Moto G – Android 8.1.0

Honor 10 of HUAWEIE– MUI 8.1.0

4. Run Demo

4.1. Setup boards

a) Set the hardware jumpers to default settings.

b) Make sure USB port has power. Refer to the readme.txt.

c) Refer to Section 2.3 and make sure the lwip_dhcp_usb demo has been built and downloaded to the board.

d) Connect UART to PC. Configure the com port in pc to get debug information.

e) Open the com port in PC device manager with serial tool, such as tera term.

4.2. Begin to run

a) Power on the board, the following information is print in the terminal.

```
host init.
```

4.3. Insert USB device

a) Connect the mobile phone to usb port on the your board.

b) The example will print the following log in the terminal.

```
host init.
 the usb tethering featue is not enabled, please turn on usb tethering in mobile phone
device not supported.
```

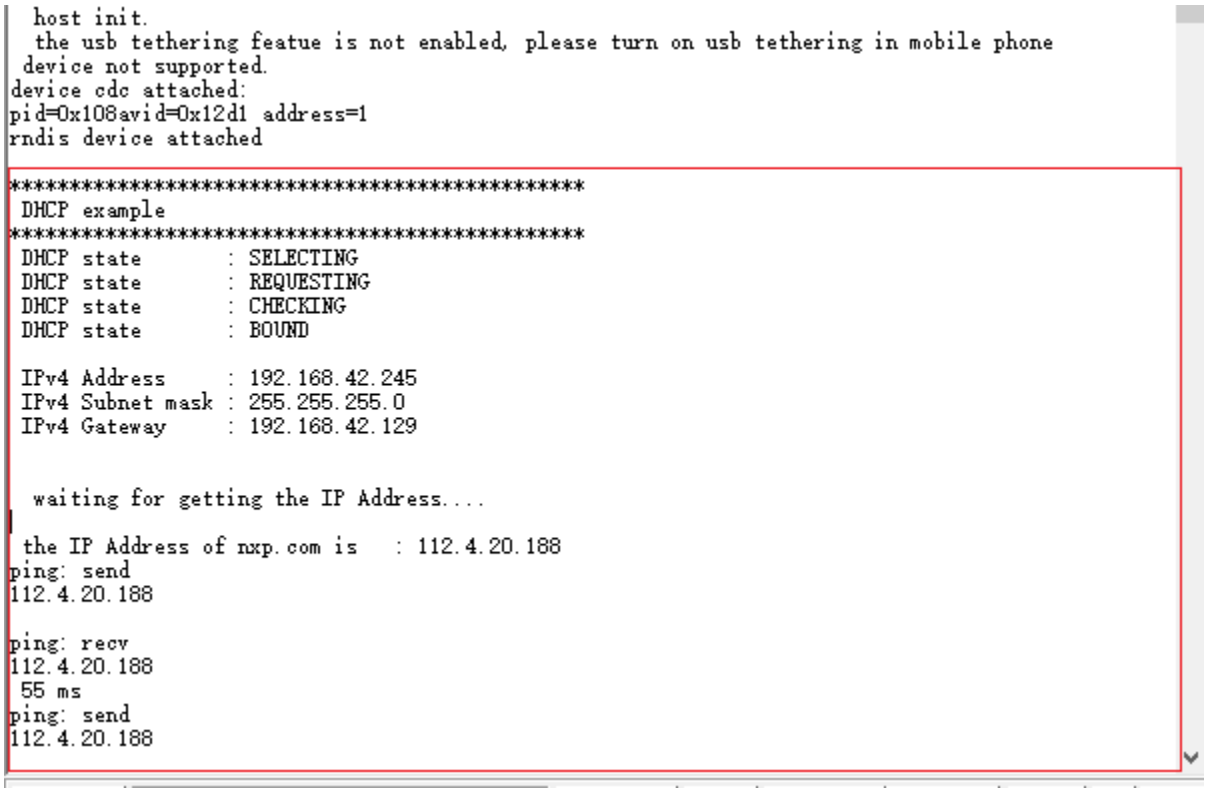
c) For the steps to turn on usb tethering feature, please reference to the 4.4.

d) After the feature is enabled. The lwip example will enumerate the mobile phone as cdc device and print the follow log in the terminal.

```
host init.
 the usb tethering featue is not enabled, please turn on usb tethering in mobile phone
device not supported
device cdc attached:
pid=0x108avid=0x12d1 address=1
rndis device attached

*************************************************
 DHCP example
*************************************************
 DHCP state       : SELECTING
 DHCP state       : REQUESTING
 DHCP state       : CHECKING
 DHCP state       : BOUND

 IPv4 Address     : 192.168.42.245
 IPv4 Subnet mask : 255.255.255.0
 IPv4 Gateway     : 192.168.42.129


 waiting for getting the IP Address....

the IP Address of nxp.com is    : 112.4.20.188
```

e) After mobile phone is enumerated, the example will get IP address and keep ping, the following log is print in the terminal

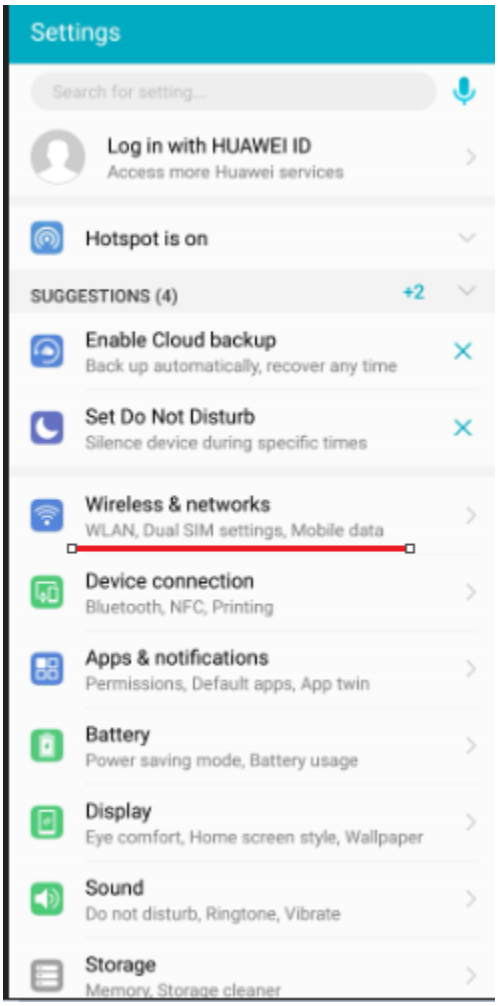
Note:
The IP information and IP address of nxp website may be different in different scenario.



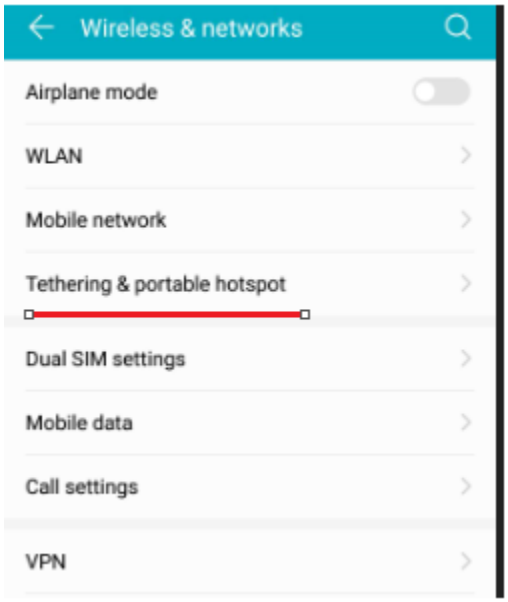
4.4. Details steps to turn on USB tethering feature on the Cellphone

Note: The following steps are used on Honor 10 cellphone on Android 8.1.0, for other cellphone or other Android version, the steps might be different.

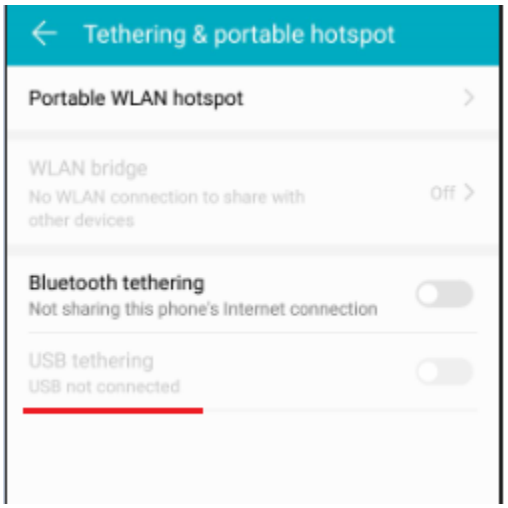
Find the system setting in mobile phone. Check the Wireless & networks.



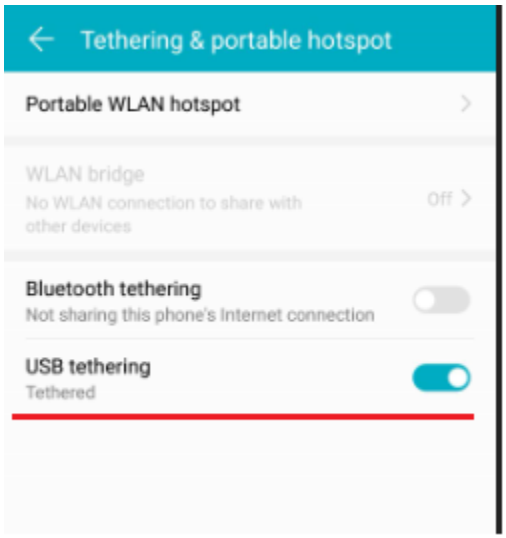
a) Check the Tethering & portable hotspot.



b) Before the mobile phone is connected to an USB RNDIS Host, the USB tethering feature can't be enabled.



c) After the mobile phone is connected to an USB RNDIS Host, the USB tethering feature could be enabled now



5. Known issue

1. if mobile phone is plugged out and then plugged in again when lwip example is ping, the ping command can't get feedback. This could only be found on MEIZU Note 3.


ping: send
112.4.20.188
ping: send
112.4.20.188
ping: send
112.4.20.188
ping: send
112.4.20.188
ping: send
112.4.20.188
ping: send
112.4.20.188
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112.4.20.188
ping: send
112.4.20.188

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