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MCUXpresso SDK USB Host RNDIS & LWIP

User's Guide

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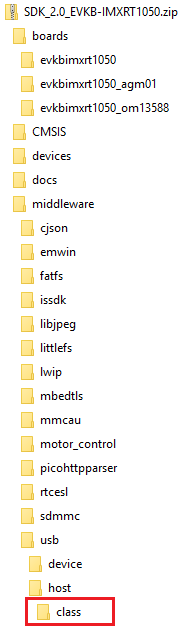
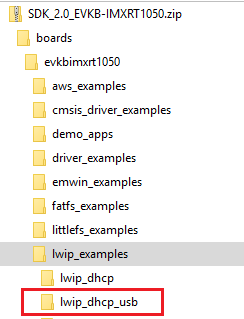
# Introduction

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.

# Software

The example was build based on MCUXpresso SDK2.4 evkbimxrt1050 package. The current version is a draft version which is **NOT**: a full-featured, a production ready software, performance tested, nor code size optimized.

## 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 |

## 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](http://www.nxp.com)
* Four toolchains are supported: IAR, KEIL, ARM GCC and MCUXpresso
* Both BM and FreeRTOS are supported

## Building the Demo

The demo projects are located in the below path.

*<root>/boards/evkbimxrt1050/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 i.MX RT1050 Derivatives.pdf to know how to build the demo/download the binary to the board

# 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

• EVKB-IMXRT1050 board

# Run Demo

## Setup boards

1. Set the hardware jumpers to default settings.
2. USB port (J9) will be used in this demo.
3. Refer to Section 2.3 and make sure the lwip\_dhcp\_usb demo has been built and downloaded to the board.
4. Connect UART(J41) to PC. Configure the com port in pc to get debug information.
5. Open the com port in PC device manager with serial tool, such as tera term.

## Begin to run

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

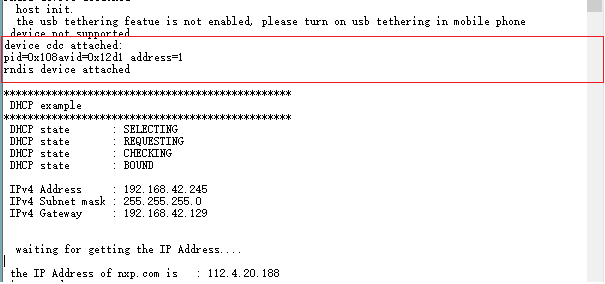


## Insert USB device

1. Connect the mobile phone to usb port (J9) on the EVKB-IMXRT1050 board.
2. The example will print the following log in the terminal.



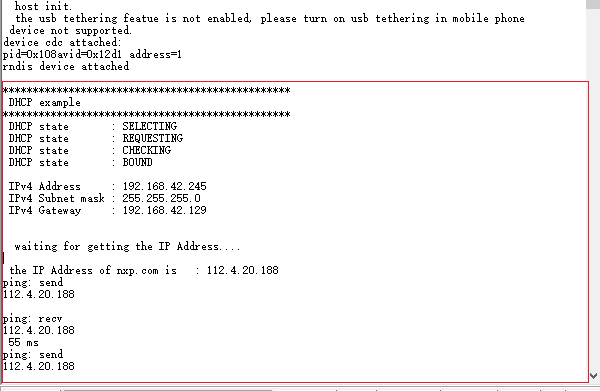
1. For the steps to turn on usb tethering feature, please reference to the 4.4.
2. After the feature is enabled. The lwip example will enumerate the mobile phone as cdc device and print the follow log in the terminal.



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

Note:

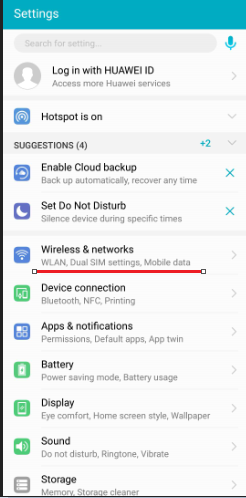
The IP information and IP address of nxp website may be different in different scenario.



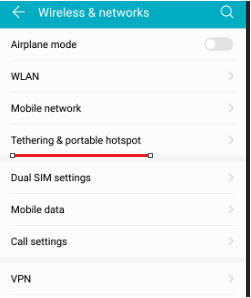
## Details steps to turn on USB tethering feature on the Cellphone

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.

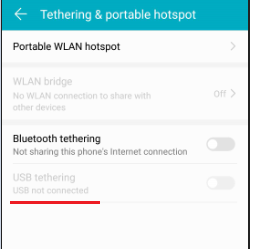
Find the system setting in mobile phone. Check the Wireless & networks.



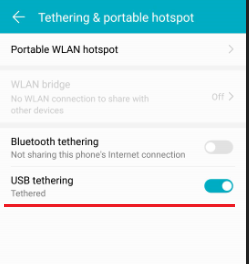
1. Check the Tethering & portable hotspot.



1. Before the mobile phone is connected to an USB RNDIS Host, the USB tethering feature can’t be enabled.

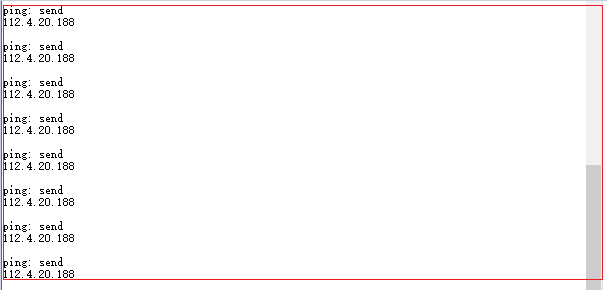


1. After the mobile phone is connected to an USB RNDIS Host, the USB tethering feature could be enabled now



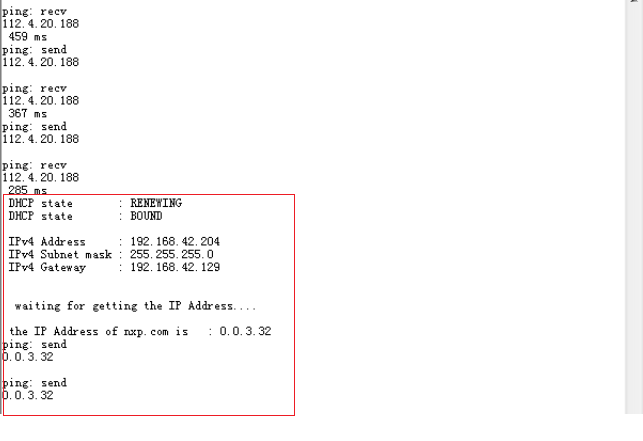
# Known issue

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.



1. The first DNS request may fail after power on or after ping command last for about 20 minutes,

This issue may be found on MEIZU Note 3, Moto G and Honor 10 when they use wifi to access internet, but could not be found on Honor 10 when Honor 10 use 4G. MEIZU Note 3 and Moto G are not tested with 4G.





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