CC3100 Transceiver Mode Application

Overview and application details

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This is a sample application demonstrating how to use CC31xx's transceiver mode of operation. This is the ability of a device to send data directly over the WLAN MAC layer without being connected to a WLAN AP.

Two use-cases that are shown in the example code are:

- TX Continuous: In this mode, the SimpleLink device is able to communicate directly over the Wi-Fi PHY layer, .i.e. bypass the Network Stack, Wi-Fi driver and MAC layer. In this mode, the user is given with a full flexibility in building the transmitted packet.

    Note: : User is fully responsible for building the transmitted packet. If it is desired to build a proprietary protocol on top of Wi-Fi PHY layer, then the user should be familiar with Wi-Fi MAC layer specifications and build the packet appropriately.

- RX Statistics: Main purpose is to provide major medium statistics.

Statistics provided by CC3100 are:

- Received Packets: The number of packets sampled.
- Received FCS: The number of packets received that had frame check sequence errors.
- Received Address Mismatch Error: The number of packets received that had Address Mismatch errors.
- Average RSSI for Management/Other Packets: The average signal strength of the management packets or data packets.
- RSSI Histogram: A histogram showing the signal strength of the different packets during the collection period.
- Rate Histogram: A histogram of the transmission rate of the different packets.
  The rates corresponding to the numbers can be found in the RateIndex_e enum in the wlan.h header file.
- Sample Time: The amount of time spent gathering samples.

More details on **Transceiver Mode** are available at CC3x00 Transceiver Mode Page

Note: This wiki page is only applicable for **CC3100-SDK v1.0.0** and upward releases. For documentation on older SDKs' examples, refer corresponding file in **<cc3100-sdk-installation-location>\cc3100-sdk\docs\examples**

Usage

- Connect the board to a Windows-PC and configure the terminal-program for seeing the logs - [| CC31xx_&_CC32xx_Terminal_Setting_Wiki [1]] has detailed instructions for configuring the terminal-program
- Build and run the project using CCS
- Connect a sniffer and filter the packets based on configured MAC/IP address.

```c
char RawData_Ping[] = {
                0x88,   /* version , type sub type */
                0x02,   /* Frame control flag */
                0x2C, 0x00,
                0x00, 0x23, 0x75, 0x55,0x55, 0x55,   /* destination */
                0x00, 0x22, 0x75, 0x55,0x55, 0x55,   /* bssid */
                0x00, 0x22, 0x75, 0x55,0x55, 0x55,   /* source */
                0x80, 0x42, 0x00, 0x00,
                0xAA, 0xAA, 0x03, 0x00, 0x00, 0x00, 0x08, 0x00, /* LLC */
                /*---- ip header start -----*/
                0x45, 0x00, 0x00, 0x54, 0x96, 0xA1, 0x00, 0x00, 0x40, 0x01,
                0x57, 0xFA,                             /* checksum */
                0xc0, 0xa8, 0x01, 0x64,                 /* src ip */
                0xc0, 0xa8, 0x01, 0x65,                 /* dest ip  */
                /* payload - ping/icmp */
                0x08, 0x00, 0xA5, 0x51,
                0x5E, 0x18, 0x00, 0x00, 0x41, 0x08, 0xBB, 0x8D, 0x00, 0x00,
                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
                0x00, 0x00, 0x00, 0x00};
```

- See the self explanatory logs on the terminal-program's console. On success, below message will be displayed on the terminal

Limitations/Known Issues

- TX continuous mode works in WiFi disconnected mode only
- The user needs to make sure the connection policy is not set to auto/fast mode
- Complete RX statistics can be obtained in disconnected mode only, however this feature can be used to get the get the RSSI of the AP the device is connected to.
- When sl_recv() API is invoked in transceiver mode, the SimpleLink device remains in RX mode and doesn't go to low power mode

References

[1] http://processors.wiki.ti.com/index.php/CC31xx_&_CC32xx_Terminal_Setting

Article Sources and Contributors

CC3100 Transceiver Mode Application *Source*: http://processors.wiki.ti.com/index.php?oldid=227220 *Contributors*: A0131814, A0132173, A0221015, Codycooke, Malokyle, SarahP

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