QUALCOMM®
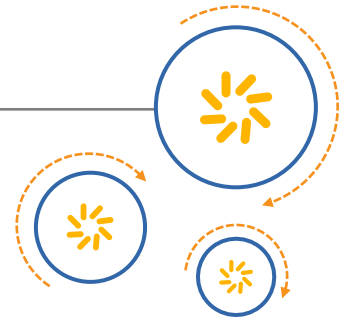
Qualcomm Technologies, Inc.

CSR8811 BD_ADDR and Trimming Cap Value

Application Note

80-YA723-1 Rev. B

August 30, 2016

Qualcomm Technologies, Inc.
5775 Morehouse Drive
San Diego, CA 92121
U.S.A.

Revision history

Revision	Date	Description
A	August 9, 2016	Initial release
B	August 30, 2016	Updates to Sections 3, 4, 5.

1 **Prerequisites**

1. Download *QCA_Networking_2016.SPF.3.0 CS Release Notes* (80-YA719-4) from CreatePoint and follow the instructions in Section 3.7.3, 'Firmware generation: IPQ4019.ILQ.1.2', to build an image locally.

2. Install bluetopia_4.2-1_ipq806x.ipk, as explained in the release notes.

NOTE:

- BlueZ was removed due to lack of support.
- Bluetooth stack of QCA_Networking_2016.SPF.3.0 is Qualcomm® Bluetopia™.

2 **Usage**

The SPF 3.0 CS is updated with a new setmac command to store Bluetooth BD_ADDR and trimming cap value in the ART partition of flash, as follows:

```
setmac -n 1 -b TRIM UNIQUE_BOARD_SERIAL_NUMBER
```

- '-n N' specifies the number of Ethernet MAC addresses to be configured starting from location 0x0. If –n is not specified, the script considers current ethX devices in DUT.
- '-b TRIM' is to configure BT MAC address and BT trim value. BT MAC address is derived similar to the Ethernet MAC address, and is written to flash only if the TRIM option is used.
- UNIQUE_BOARD_SERIAL_NUMBER is used as seed to generate a unique set of MAC addresses, prefixed by Qualcomm OUI (00:03:7f).

Existing (ES/ED)			Proposed (CS)		
Start offset	**Length**	**Usage**	**Start offset**	**Length**	**Usage**
0x0	0x1000	Non Wi-Fi data	0x0	0x40 (64 bytes)	Network data
–	–	–	0x40	0x40 (64 bytes)	Bluetooth
–	–	–	0x80	0xF80 (3968 bytes)	Reserved for future use

NOTE: MAC address is not specified for Ethernet/BT to the setmac command.

After the setmac command is executed successfully, data is written to ART partition and persists across reboots.

Example

```
setmac -n 1 -b 1d DB149-010-N0001
Trim value = 0x1d
```

```
BD_ADDR = 00:03:7f:[convert "DB149-010-N0001" string via md5, 3 bytes]
```

3 Verify BD_ADDR

1. Check the ART partition.

```
root@OpenWrt:/# cat proc/mtd
dev:     size    erasesize   name
mtd0: 00100000 00020000 "0:SBL1"
mtd1: 00100000 00020000 "0:MIBIB"
mtd2: 00100000 00020000 "0:BOOTCONFIG"
mtd3: 00100000 00020000 "0:QSEE"
mtd4: 00100000 00020000 "0:QSEE_1"
mtd5: 00080000 00020000 "0:CDT"
mtd6: 00080000 00020000 "0:CDT_1"
mtd7: 00080000 00020000 "0:BOOTCONFIG1"
mtd8: 00080000 00020000 "0:APPSBLENV"
mtd9: 00200000 00020000 "0:APPSBL"
mtd10: 00200000 00020000 "0:APPSBL_1"
mtd11: 00080000 00020000 "0:ART"
mtd12: 04100000 00020000 "rootfs"
mtd13: 03300000 00020000 "rootfs_1"
mtd14: 01000000 00010000 "spi0.0"
mtd15: 003a2000 0001f000 "kernel"
mtd16: 00d90000 0001f000 "ubi_rootfs"
mtd17: 02caf000 0001f000 "rootfs_data"
```

2. Dump for new DK07 board without BD_ADDR and trimming cap value:

```
root@OpenWrt:/# hexdump -C /dev/mtd11
00000000  55 42 49 23 01 00 00 00  00 00 00 00 00 00 00 00
|UBI#............|
00000010  00 00 08 00 00 00 10 00  7c d5 a4 39 00 00 00 00
|........|..9....|
00000020  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
|................|
00000030  00 00 00 00 00 00 00 00  00 00 00 00 65 d3 27 16
|............e.'.|
00000040  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff
|................|
```

3. Set environment variable to load BD_ADDR and trimming cap value.

```
root@OpenWrt:/# export BTHOST_BD_ADDR
root@OpenWrt:/# export BTHOST_XCAL_TRIM
```

Platform/Module	Environment variable	Default configuration
All	export BTHOST_BD_ADDR	cat /tmp/BTHOST_BD_ADDR
All	export BTHOST_XCAL_TRIM	cat /tmp/BTHOST_XCAL_TRIM

4. Write a string for BD_ADDR (DB149-010-N0001) and trimming cap value (0x1d).

```
root@OpenWrt:/# setmac -n 1 -b 1d DB149-010-N0001
00000000  00 03 7f d1 bc a2 00 00  00 00 00 00 00 00 00 00
|...............|
00000010  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
|...............|
*
00000040  00 03 7f 29 3f 5f 1d                       |...)?_.|
```

NOTE: The hex for BD_ADDR is transferred by md5 from string.

5. Dump again to check.

```
root@OpenWrt:/# hexdump -C /dev/mtd11
00000000  00 03 7f d1 bc a2 00 00  00 00 00 00 00 00 00 00
|...............|
00000010  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
|...............|
*
00000040  00 03 7f 29 3f 5f 1d 00  00 00 00 00 00 00 00 00
|...)?_..........|
```

6. Cut-off power and boot up.

7. Check the environmental variable.

```
root@OpenWrt:/# env
SHLVL=2
HOME=/root
PS1=\u@\h:\w\$
TERM=linux
PATH=/usr/sbin:/usr/bin:/sbin:/bin
BTHOST_XCAL_TRIM=0x001d
BTHOST_BD_ADDR=0x0300297f5f3f
PWD=/
```

8. Check using Bluetopia LinuxHCI.

```
root@OpenWrt:/# export BTHOST_8311_SOC_TYPE=onboard
root@OpenWrt:/# LinuxHCI 1 /dev/ttyQHS0 115200
HCI_VS_InitializeBeforeHCIOpen: Enter
HCI_VS_InitializeBeforeHCIOpen: Exit(0)
HCI_VS_InitializeAfterHCIOpen: Enter
HCI_VS_InitializeAfterHCIOpen: Exit
Applying Coex PSkeys for : onboard
Completed downloading custom PSKEYS!!
HCI_VS_InitializeBeforeHCIReset: Exit(0)
HCI_VS_InitializeAfterHCIReset: Enter
HCI_VS_InitializeAfterHCIReset: Exit
Stack Initialization on Port -1 115200 (UART) Successful.
```

```
Device Chipset Version: 4.2Return Value is 1
HCI_Register_Event_Callback() SUCCE
SS.
Return Value is 2 HCI_Register_ACL_Data_Callback() SUCCESS.

********************************************************************
* Command Options: Reset, Version, GetBD_ADDR, SetScanMode,       *
*                  SetAutoAccept, Accept, Reject, Inquiry,        *
*                  ConnectACL, SendACLData, DisconnectACL,        *
*                  AddSCO, DisconnectSCO, EnableDebug, Help,      *
*                  Quit.                                          *
********************************************************************
HCI>GetBD_ADDR

HCI_Read_BD_ADDR() Success: 0
Local Device Address is : 0x0300299F7F5F
HCI>
```

9. Check using Bluetopia LinuxSPPLE.

```
root@OpenWrt:/# export BTHOST_8311_SOC_TYPE=onboard
root@OpenWrt:/# LinuxSPPLE 1 /dev/ttyQHS0 115200

OpenStack().
HCI_VS_InitializeBeforeHCIOpen: Enter
HCI_VS_InitializeBeforeHCIOpen: Exit(0)
HCI_VS_InitializeAfterHCIOpen: Enter
HCI_VS_InitializeAfterHCIOpen: Exit
Applying Coex PSkeys for : onboard
Completed downloading custom PSKEYS!!
HCI_VS_InitializeBeforeHCIReset: Exit(0)
HCI_VS_InitializeAfterHCIReset: Enter
HCI_VS_InitializeAfterHCIReset: Exit
Bluetooth Stack ID: 1.
Device Chipset: 4.2.
BD_ADDR: 0x0300299F7F5F

********************************************************************
* Command Options General: Help, GetLocalAddress,                 *
*                          EnableDebug, GetMTU, SetMTU            *
* Command Options GAPLE:   SetDiscoverabilityMode,               *
*                          SetConnectabilityMode,                *
*                          SetPairabilityMode,                   *
*                          ChangePairingParameters,              *
*                          AdvertiseLE, StartScanning,           *
*                          StopScanning, ConnectLE,              *
*                          DisconnectLE, PairLE,                 *
*                          LEPasskeyResponse,                    *
*                          QueryEncryptionMode, SetPasskey,      *
*                          DiscoverGAPS, DiscoverDIS,            *
```

```
*                               GetLocalName, SetLocalName,         *
*                               GetRemoteName,                      *
*                               SetLocalAppearance,                 *
*                               GetLocalAppearance,                 *
*                               GetRemoteAppearance,                *
* Command Options SPPLE:   DiscoverSPPLE, RegisterSPPLE,            *
*                               UnregisterSPPLE, Send,              *
*                               ConfigureSPPLE, Read, Loopback,     *
*                               DisplayRawModeData, AutomaticReadMode *
******************************************************************

        SPPLE>
```


Figure 1 UART sniffer log

4 Verify trimming cap

- The "XCAL TRIM being assigned from flash" message in the console indicates the successful loading of trimming cap value.

- Check initial frequency error under Tx radio test using the Qualcomm tools − QDART and BTDiag.

MAY CONTAIN U.S. AND INTERNATIONAL EXPORT CONTROLLED INFORMATION

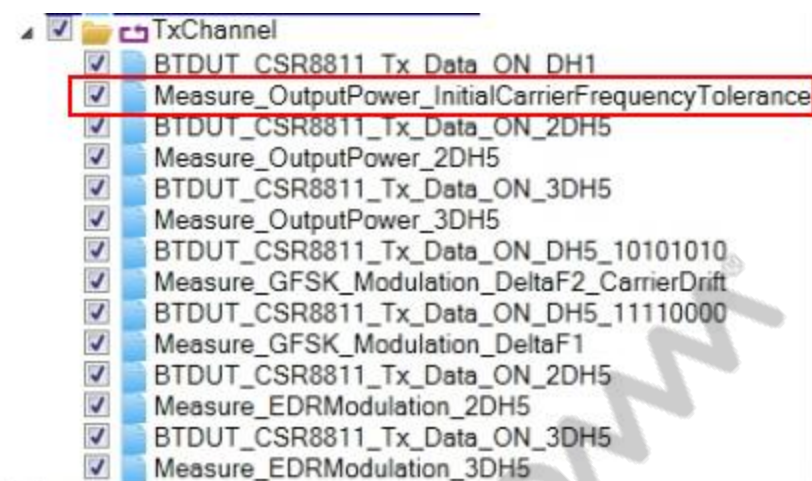Figure 2 shows the test tree for initial frequency error in QSPR.

Figure 2 Test tree for initial frequency error

5 Bluetooth BQB qualification

Bluetopia

QDID	Declaration ID	Name	Production	Company	Product Type	Spec Name	Date
78585	D030027	Bluetopia Dual Mode	Bluetopia	Qualcomm Atheros	Host Subsystem	4.2	5-Feb-16
78586	D030028	Bluetopia Single Mode	Bluetopia	Qualcomm Atheros	Host Subsystem	4.2	5-Feb-16
70273	D027188	Bluetopia Single Mode Profile Subsystem	Bluetopia Single Mode Profile Subsystem	Stonestreet One, LLC	Profile Subsystem	4.1	30-Jul-15
70271	D027187	Bluetopia Dual Mode Profile Subsystem	Bluetopia Dual Mode Profile Subsystem	Stonestreet One, LLC	Profile Subsystem	4.1	27-Jul-15

CSR8811

QDID	Declaration ID	Name	Production	Company	Product Type	Spec Name	Date
79716	D028089	BlueCore® CSR8311, Automotive, BlueCore® CSR8811A12	BlueCore® CSR8311 Automotive (4.2)	Qualcomm Technologies International, Ltd. (QTIL)	Controller Subsystem	4.2	1-Feb-16

Customers can inherit QDID without retesting the protocol stack (host subsystem and controller subsystem) and profiles (profile subsystem) for BQB certification.

■ If the product supports BR/EDR, retest the RF.

■ If the product supports LE, retest the RF-PHY.

For more information, see:

- BQB test spec:

  https://www.bluetooth.com/specifications/qualification-test-requirements

- For qualification and list:

  https://www.bluetooth.com/develop-with-bluetooth/qualification-listing

- BQTF list (send the product to the list to pass BQB certification)

  https://www.bluetooth.org/apps/qualification/bqtf.aspx

  In case of questions, contact the BQTF vender. They can help finish the BQB processes.