Qualcomm Gobi3000™ Linux Package Guide

80-VF219-14 A Draft

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Submit technical questions at:
https://support.cdmatech.com/

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Contents

Tables

Revision history

Revision	Date	Description
A	Sept 2010	Initial release

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1 Introduction

1.1 Purpose

The Gobi3000™ Linux Package provides the card OEM with all the necessary components to build the Gobi3000 software deliverable. This document describes those components.

1.2 Scope

This document is intended for developers of card OEMs who want to build Gobi3000 software deliverables using the Gobi3000 Linux Package with a Qualcomm Gobi3000-based data card.

1.3 Conventions

Function declarations, function names, type declarations, file names, directories/paths, and code samples appear in a different font, e.g., `#include`.

Code variables appear in angle brackets, e.g., `<number>`.

1.4 References

Reference documents, which may include QUALCOMM®, standards, and resource documents, are listed in Table 1-1. Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers may not be sequential.

Table 1-1 Reference documents and standards

Ref.	Document	
Qualcomm		
Q1	*Application Note: Software Glossary for Customers*	CL93-V3077-1
Q2	*QMI Architecture*	80-VB816-1
Q3	*QMUX Control Transport Protocol*	80-VB816-2
Q4	*QMI Control Service*	80-VB816-3
Q5	*QMI Wireless Data Service*	80-VB816-5
Standards		
S1	*Universal Serial Bus Class Definitions for Communication Devices*	Version 1.1
S2	*Universal Serial Bus Specification*	Revision 2.0
S3	*Universal Serial Bus CDC Subclass Specification for Wireless Mobile Communication Devices*	Version 1.0

1.5 Technical assistance

For assistance or clarification on information in this guide, submit a case to Qualcomm CDMA Technologies at https://support.cdmatech.com/.

If you do not have access to the CDMATech Support Service website, register for access or send email to support.cdmatech@qualcomm.com.

1.6 Acronyms

For definitions of terms and abbreviations, see [Q1].

2 Reference platform

The code provided in the Gobi 3000™ Linux package is designed to work on one reference platform. Additional platform support must be provide by the customers.

2.1 Hardware

HP ProBooks 4310s

2.2 Operating system

Ubuntu 9.10 (i386 desktop), available from

http://mirrors.kernel.org/ubuntu-releases/9.10/ubuntu-9.10-desktop-i386.iso

2.2.1 Kernel

Kernel 2.6.31-14-generic (default provided by Ubuntu 9.10)

2.2.2 Compilers and Tools

GNU Make utility (3.81)

```
# apt-get install make
```

GNU C compiler (4.4.1)

```
# apt-get install gcc
```

GNU C++ compiler (4.4.1)

```
# apt-get install g++
```

Linux kernel headers (2.6.31-14-generic)

```
# apt-get install linux-headers-`uname -r`
```

3 Drivers

The drivers for Gobi3000™ are released under GPL v2 license as open source, and are available from Code Aurora (www.codeaurora.org/patches/quic/gobi).

3.1 GobiNet

The GobiNet Driver is designed as a network interface and a controlling QMI interface

3.1.1 Network interface

The GobiNet driver enumerates a network interface "usb#" for TCP/IP traffic. The GobiNet driver relies heavily on the Linux "usbnet" driver and acts similar to an Ethernet device.

3.1.1.1 Link status

The network interface will only show "carrier on" when a data connection is established. This is used by many connection managers to indicate a TCP/IP session may be started, independent from the GobiConnectionMgmt API.

3.1.2 QMI Interface

The QMI interface (/dev/qcqmi#) is exposed for QMI clients (IE: GobiConnectionMgmt API) to attach to. Multiple vendor-specific QMI interfaces are exposed to user space in this method.

For more information on QMI, see [Q2], [Q3], [Q4], and [Q5].

3.1.2.1 IOCTL support

3 IOCTLs are supported by the QMI interface, they are described below.

3.1.2.2 QMI_GET_SERVICE_FILE

IOCTL number: 0x8BE1
Argument: unsigned long   [I] the requested QMI service type.

The QMI_GET_SERVICE_FILE IOCTL requests the GobiNet driver create a QMI client for the specified service type. This must be run before reading or writing.

3.1.2.3 QMI_GET_VIDPID

IOCTL number: 0x8BE2
Argument: unsigned long *   [O] the VIDPID of the device.

The QMI_GET_VIDPID IOCTL returns the VIDPID of the device. This is no longer in use but is provided for legacy support.

3.1.2.4 QMI_GET_MEID

IOCTL number: 0x8BE3

Argument: char[14] *   [O] the MEID of the device.

The QMI_GET_MEID IOCTL returns the MEID of the device. This is used to uniquely identify a Gobi device.

3.1.3 Selective suspend / Autosuspend

Autosuspend is supported by the Gobi device and GobiNet driver, but by default it is not enabled by the open source kernel. As such, the Gobi device will not enter autosuspend unless the user specifically turns on autosuspend with the command:

```
echo auto > /sys/bus/usb/devices/.../power/level
```

3.2 GobiSerial

The GobiSerial driver is used by the QDL, Modem, and GPS interfaces. Each interface will enumerate a tty port (/dev/ttyUSB#)

3.2.1 QDL interface

The QDL interface will only be enumerated when the device is in Boot mode. It is designed for use by the GobiImageMgmt API and GobiQDLService.

3.2.2 Modem interface

The modem interface may be used for AT command and dial up networking (PPP). This interface is considerably slower than the network interface, but may be used by legacy connection managers.

3.2.3 GPS interface

The GPS interface will continually provide NMEA sentences when opened, and can be used by GPS clients.

3.3 Enabling debugging

To enabled debugging, set the module parameter "debug" to true. This must be done for each driver as desired, the below example is for the GobiNet driver.

Method 1: modprobe GobiNet debug=y

Method 2: echo y > /sys/module/GobiNet/parameters/debug

The debug output will be sent to the kernel message log, and may be gathered with kmsg or syslog.

3.4 Building and installing the drivers

To build the drivers, the ./Drivers/GobiNet or ./Drivers/GobiSerial folder is needed.

To build, run the command:

```
# make
```

To install to the default locations, run the command:

```
# make install
```

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4 Gobi Image Management Library

4.1 Building the Gobi Image Management Library

To build the library the following source code folders are needed:

```
./Core
./Database
./GobiImageMgmt
./Shared
```

To build, run the command:

```
# make
```

To install to the default locations, run the command:

```
# make install
```

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5 Gobi Connection Management Library

5.1 Building the Gobi Connection Management Library

To build the library the following source code folders are needed:

```
./Core
./Database
./GobiConnectionMgmt
./Shared
```

To build, run the command:

```
# make
```

To install to the default locations, run the command:

```
# make install
```

6 Gobi Firmware Downloader

6.1 Building the Gobi Firmware Downloader

To build the downloader the following source code folders are needed:

```
./Core
./GobiQDLService
./Shared
```

To build, run the command:

```
# make
```

To install to the default locations, run the command:

```
# make install
```

7 Gobi Platform Integration

There are interdependencies between the multiple components of this package. To fulfill these dependencies, Qualcomm uses the following locations for these files.

7.1 Gobi Firmware Downloader

The Gobi Firmware Downloader must be placed in the following location:

```
/opt/Qualcomm/GobiQDLService/
```

The firmware downloader is controlled by a udev rule. The following steps are required to configure the udev daemon.

a. Place the udev rule file in the udev directory

```
/etc/udev/rules.d/99-GobiQDLService.rules
```

b. Reload the udev rules

```
# udevadm control --reload-rules
```

7.2 Firmware

Firmware is not distributed in this package; however, to work with the default Qualcomm integration it must be placed in subfolders at the following location:

```
/opt/Qualcomm/Gobi/Images/3000/Generic/
```