LTE&5G QFirehose
Linux&Android User Guide

LTE/5G Module Series

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GENERAL NOTES

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About the Document

History

Revision	Date	Author	Description
1.0	2019-08-12	Carl YIN	Initial
1.1	2019-08-12	Carl YIN	Corrected the applicable module RM550Q as RM500Q

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1 Introduction

This document mainly introduces how to use the QFirehose tool to upgrade the firmware of the following Quectel LTE and 5G modules in Linux and Android systems.

1.1. Applicable Modules

Table 1: Applicable Modules

Module Series		Models
LTE	LTE Standard	• EC2x: EC21/ EC25/ EC20 R2.0/ EC20 R2.1 • EG9x: EG91/ EG95 • EM05 • EG25-G
	Automotive	• AGxx: AG35/ AG15/ AG520R/ AG550Q
	LTE-A	• Ex06: EG06/ EP06/ EM06 • Ex12: EG12/ EM12 • EG18 • EM20
5G		• Rx500Q: RG500Q/ RM500Q • Rx510Q: RG510Q/ RM510Q

NOTE

The simplest way to judge if QFirehose is supported is to check the existence of the directory *update/firehose* in the target firmware package. If it exists, the firmware can be upgraded with QFirehose. In addition, before running the tool, the target firmware package needs to be unzipped.

2 Directories in Tool Package

QFirehose tool package contains pre-built binary tools, source codes and log files, which are shown as below:

Table 2: Directories in Tool Package

Directory	Description
android	The directory contains two pre-built binary tools for Android platform and can be selected and used directly according to customers' requirements.
log	The directory contains log files of successful firmware upgrade for failure analysis.
android.mk	Source codes for Linux system.
Makefile	
.c and *.h* files	

3 Command Arguments

The command arguments in command line of QFirehose program can be specified, and the detailed arguments are illustrated as below.

Table 3: Description of Command Arguments

Number	Argument	Optional/ Mandatory	Description
1	-f <firmware package file name>	Mandatory	The name of the target firmware package.
2	-p <port>	Optional	The port (/dev/ttyUSBx) for firmware upgrade. If this argument is not set, QFirehose will automatically detect the port.
3	-s </sys/bus/usb/devices/xx>	Optional	When there are multiple modules on customers' device, the argument is used to specify which module that customers want to upgrade firmware, and usually remains unchanged when customers' device reboots. When there is only one module on customers' device, the argument is not required.
4	-z <0/1>	Optional	● 1 is the default value, and is used in the following case: If the USB host controller type on customers' device is XHCI, the USB zero-length bug has already been fixed by XHCI driver when Linux kernel version is 4.2 or greater (see commit 4758dcd19a7d9ba9610b38fecb93f65f56f86346 for details). ● 0 is used in the following case: If the USB zero-length bug has not been fixed on customers' device, "-z 0" must be set to ensure successful firmware upgrade.

| 5 | -e | Optional | Erase the Nand Flash before upgrading. Please do not set this argument unless authorized by Quectel. |

4 How to Use QFirehose Tool

This chapter mainly introduces the procedure of using QFirehose to upgrade the firmware in Linux and Android systems.

4.1. Compile Source Codes or Use Pre-built Binary Tool

● In Linux system, the source codes of the tool need to be compiled with the following command.

```
make CROSS_COMPILE=<your platform's cross compiler>
```

After compilation, put the QFirehose tool to a directory of customer's device.

● In Android system, the two pre-built binary QFirehose tools under directory *android* for Android platform can be selected and used directly according to customers' requirements.

4.2. Upgrade Firmware Locally

Please follow the following steps to upgrade firmware locally.

1. Put the target firmware package and QFirehose tool to customers' device.

2. Run QFirehose with the following command on customers' device:

```
./QFirehose   -f <firmware package file name>
```

The lastlog or exit codes in the QFirehose program can be used to judge whether the firmware is upgraded successfully. Exit codes can be viewed with the following command.

```
# echo $?
```

The lastlog as below indicates successful firmware upgrade.

```
root@cqh6:~/QFirehose_linux# ./QFirehose -f ../EM20GRAR01A04V01M4G
[000.000] QFirehose Version: LTE&5G_QFirehose_Linux&Android_V1.2
……..
[046.384] THE TOTAL DOWNLOAD TIME IS 42.831 s
```

```
[046.385] Upgrade module successfully.
root@cqh6:~/QFirehose_linux#
root@cqh6:~/QFirehose_linux# echo $?
0
root@cqh6:~/QFirehose_linux#
```

The lastlog as below indicates that the firmware upgrade failed.

```
root@cqh6:~/QFirehose_linux# ./QFirehose -f ../EM20GRAR01A04V01M4G
[000.000] QFirehose Version: LTE&5G_QFirehose_Linux&Android_V1.2
…….
[041.136] Upgrade module fail.
root@cqh6:~/QFirehose_linux# echo $?
172
```

If the firmware upgrade fails, then the log file *MCU_local.log.txt* under the directory *log* in the tool package can be used to help failure analysis.

4.2.1. Matters Needing Attention on Ubuntu PC

If Quectel's module is connected to Ubuntu PC, and customers want to upgrade the firmware of the module on it. Software "qcseria.ko" and "ModeManager" on PC may cause the upgrade to fail and need to be removed.

Please follow the following steps to ensure successful firmware upgrade.

1. Remove software "qcseria.ko" with the following command.

   ```
   $ sudo rm /lib/modules/`uname -r`/kernel/drivers/usb/serial/qcserial.ko
   ```

2. Remove software "ModeManager" with the following command.

   ```
   $ sudo apt remove modemmanager
   ```

3. The Linux kernel version of Ubuntu PC is strongly recommended to be higer than 4.2. And the current version can be viewed with the following command.

   ```
   $ uname   -r
   ```

4. Reboot Ubuntu PC to make the above steps take effect.

4.3. Upgrade Firmware Remotely

If there is not enough disk space on customers' device to save the target firmware package. QFirehose tool supports remote firmware upgrade via TCP socket, and the steps are as below.

1. Put the target firmware package and QFirehose tool to an Ubuntu PC.

2. Put QFirehose tool to customers' device.

3. Run the following command to select port "9008" for firmware upgrade on customers' device.

    ./QFirehose -p 9008

4. Run the following command to upgrade firmware on the Ubuntu PC.

    ./QFirehose -f <firmware package file name> -p <the customer board's IP>:9008

If the firmware upgrade fails (failure indication can be referred in **Chapter 4.2**), then the log files *MCU_remote.log.txt* and *Ubuntu_remote.log.txt* under directory *log* in the tool package can be used to help failure analysis.

5 Appendix A Reference

Table 4: Terms and Abbreviations

Abbreviation	Description
TCP	Transmission Control Protocol
USB	Universal Serial Bus
XHCI	eXtensible Host Controller Interface