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FIBOCOM RIL FOAT Upgrade & Package Upgrade Instruction Manual

Version: V1.0.1
Date: 2018-06-12

Applicable Model

S/N	Product Model	Description
1	NL668 series	NA
2		
3		

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Versions

Version	Update Date	Description
V1.0.0	2018-06-05	Initial version
V1.0.1	2018-06-12	Add the package upgrade nv_list file

Contents

1 Overview

This document explains the whole package upgrade and FOAT upgrade process in RIL, and related code description.

Note:

The steps and methods described in the document are based on the x3399 device (Android 6.0 system). Other products are similar to this one.

2 Whole Package Upgrade

The whole package upgrade uses the modem_upgrade executable file, firmware.bin upgrade package, and nv_high_list, nv_low_list file for upgrade. The firmware.bin upgrade package needs to be developed and provided to clients, or obtained in the corresponding version package.

Note: The corresponding modem_upgrade executable file needs to be selected according to different android versions and 32/64 bit option.

2.1 Preparation Before the Upgrade

Before the upgrade, you need to push the modem_upgrade file to the executable directory of the client device, such as the /data directory, and modify the file’s execution permission. Specific steps are as follows:

```
adb root            //get administrator (root) permission, if the device is already administrator (root) permission, this step can be omitted
adb remount         //get system read and write permissions
adb push D:\modem_upgrade /data        //put the executable file into the /data directory
adb push D:\ firmware.bin /data        //put the upgrade package into the /data directory
adb push D:\ nv_high_list /data        //put the high-order NV list into the /data directory
adb push D:\ nv_low_list /data         //put the low-order NV list into the /data directory
adb shell           //enter device system
cd data
chmod 777 modem_upgrade                //modify file with executable permission
```

2.2 Upgrade Parsing

After the executable program and upgrade package are pushed, the module will be upgraded. Before the upgrade, make sure that the executable program and the upgrade package exist, and the module enumerates ports; otherwise, it will fail.

2.2.1 Upgrade Command

```
/data/modem_upgrade /data/firmware.bin /data/ /dev/ttyUSB3 /dev/ttyUSB0 1 9x07
```

2.2.2 Parameter Interpretation

/data/modem_upgrade：executable program path (if it is in the /data directory, it can be changed to ./modem_upgrade)

/data/firmware.bin：upgrade package path (if it is in the /data directory, it can be changed to ./firmware.bin)

/data/：path to save upgrade LOG during upgrade

/dev/ttyUSB3：NEMA port as the port to send AT during the upgrade

/dev/ttyUSB0：DIAG port as the port to transfer data during the upgrade

1: Backup NV or not

9x07: module platform information

2.2.3 Upgrade Sign

During the upgrade process, set an property value, “modem.upgrade.sign”. After the upgrade is complete, the client can query whether the upgrade is successful based on this property value and version number. The definition of the property value is as follows:

UP_SUESS = 0
UP_GENERIC_ERROR = 1
UP_OPEN_AT_ERROR = 2
UP_IRMWARE_MASK_ERROR = 3
UP_BACKUP_NV_ERROR = 4
UP_SWITCH_FASTBOOT_ERROR = 5
UP_DOWNLOAD_HEADER_ERROR = 6
UP_DOWNLOAD_DATA_ERROR = 7
UP_FINISH_DOWNLOAD_DATA_ERROR = 8
UP_FASTBOOT_FLASH_ERROR = 9

UP_FASTBOOT_REBOOT_ERROR = 10
UP_RESTORS_NV_ERROR = 11
UP_FIRMWARE_DATA_ERROR = 12

3 FOAT Upgrade

The FOAT upgrade uses the AT command to upgrade the module. Differential package is needed for upgrade. Differential package files need to be developed and provided to clients.

3.1 Preparation Before the Upgrade

Before the upgrade, you need to push the differential package to the executable directory of the client device, such as the /data directory. Specific steps are as follows:

adb root //get administrator (root) permission, if the device is already administrator (root) permission, this step can be omitted

adb remount //get system read and write permissions

adb push xxxx /data //put the differential package (xxxx differential package) into the /data directory

Note:

When a differential upgrade is performed, the basic version of the module needs to be the same as the basic version of the differential package.

For example: Differential package name is: 19006.1100.00.01.74.06-06_561.zip

Therefore, when in upgrade, the basic version of the module should be 19006.1100.00.01.74.06

After successful upgrade, the module version is 19006.1100.00.01.74.06_561

3.2 Upgrade Parsing

3.2.1 Upgrade Command and Parameter Interpretation

The upgrade steps are as follows:

The first step:

Create new file: AT+RMTFSCREATE=<path>

<path>: Generally /cache/delta.zip

The second step:

Write data to the end of the file: AT+RMTFSWRITESTAR= <path>,<sum>,<write_addr>,<len>,<data>

<path>: Path is AT+RMTFSCREATE creation parameter

<sum>: Check code, hexadecimal of data byte is multiplied by the index of this byte (starting from 1), plus file offset, hexadecimal input

<write_addr>: IMG write offset address for retransmission, hexadecimal input

<len>: the length of this transmission, hexadecimal input, such as: length 32, input 20

<data>: Hexadecimal data, write data to the module as a string

Note:

When data is written to the end of the file, data of the differential package needs to be read cyclically and then written into the file.

The third step:

Verify file MD5 value: AT+RMTFSWRITEFIN=<path>,<md5>

<path>: Path is AT+RMTFSCREATE creation parameter

<md5>: The 32-bit md5 check code module checks and compares the complete IMG calculation 32-bit MD5. The same returns OK, otherwise ERROR.

The fourth step:

Differential upgrade command: AT+DELTA

No parameter, indicates performing differential upgrade

3.2.2 Upgrade Sign

After the upgrade is complete, the client can query whether the upgrade is successful based on the version number.

4 Note

In the RIL upgrade plan, it needs to update to so library that supports upgrade (note: general so library does not support the upgrade by default, please contact the drive engineer for confirmation), and also requires the client to add the corresponding request in the upper Android, in order to call upgrade program, and needs to add a corresponding active report as one of the conditions to judge the upgrade. The defined request can be defined by the client, and then the information can be synchronized to R&D. It can also be defined by R&D, and the client can add correspondingly.