

EC2X&AG35-QuecOpen

Partition Adjustment

Method

LTE Module Series

Rev. EC2X&AG35-QuecOpen_Partition_Adjustment_Method

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About the Document

History

Revision	Date	Author	Description
1.0	2017-09-11	Ramos ZHANG	Initial
1.1	2018-03-14	Ramos ZHANG	Updated configuration instruction for firehose downloading.

Contents

	About the Document.....	2
	Contents.....	3
	Introduction	4
	Partitions Related to Customers	5
	The Adjustment of OpenLinux Partition Table	6
1	The method for Partition Adjustment	6
2	The Notes for Partition Adjustment	7
3	Partition.mbn Generation.....	8
3.1.	Replace Downloading Configuration File of Firehose.....	9
4	Add UBI File System.....	10
5	Generarte New UBI File System.....	10
6	Download New UBI File System to Corresponding Partition	10
6.1.	Load Newly Added UBI File System when System Boot.....	10
6.2.		
6.3.		

Introduction

This document mainly introduces how to adjust partition table, add partition, and notes of modifying partitions and firmware downloading after modifying partitions.

1

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Partitions Related to Customers

Customer-related partitions are those related to customer application and configuration parameter data store which can be adjusted. Other irrelevant partition cannot be modified by customer.

Table 1: Partitions Related to Customers

Partition	Default Size	Available Size	Partition Format	Mount Point	Purpose
usr_data	124.25M	About 100M	UBI file system	/usrdata	Store, write and read users' data, application and parameter configuration.
sys_back	58M	Disabled	Image	Not mount	Rootfs volume backup, can be resized according to the actual situation, unavailable.
system	88.75M	About 19M	UBI file system	/	Rootfs volume, readable-writable partition, can store customers' app and parameter configuration.

If integrating the quectel fota upgrade feature is required, at least 60M space of usr_data partition must be reserved. Sys_back partition is used to backup system partition, if the system partition holds large data, the sys_back partition should be adjusted accordingly, the minimum requirement is to add 6M based on the customer system ubi size, and customers cannot store large data in the system in later use.

The usr_data partition is loaded in /etc/init.d/find_partitions.sh script, if this partition mount failed, it will be reformatted and cause customers' APP or data stored in this partition lost. Please refer to the code in find_partitions.sh for the specific implementation method.

For the backup solution for customers' APP and important parameter, please refer to **Quectel_EC2X-QuecOpen_Important_Data_Backup_and_Update_Solution**.

The Adjustment of OpenLinux Partition Table

3

The method for Partition Adjustment

- 3.1. The file partition.mbn in the update directory in firmware package is the partition table that downloaded into module, and the partition_nand.xml is the configuration file to make partition.mbn. The configuration file partition_nand.xml is shown as below.

```
<partition>
  <name length="16" type="string">0:usr_data</name>
  <size_kb length="4">126564</size_kb>
  <pad_kb length="4">512</pad_kb>
  <which_flash>0</which_flash>
  <attr>0xFF</attr>
  <attr>0x01</attr>
  <attr>0x00</attr>
  <attr>0xFF</attr>
  <img_name type="string">usrdata.ubi</img_name>
</partition>
<partition>
  <name length="16" type="string">0:sys_back</name>
  <size_kb length="4">58880</size_kb>
  <pad_kb length="4">512</pad_kb>
  <which_flash>0</which_flash>
  <attr>0xFF</attr>
  <attr>0x01</attr>
  <attr>0x00</attr>
  <attr>0xFF</attr>
  <img_name type="string">mcm9607-perf-sysfs.ubi</img_name>
</partition>
<partition>
  <name length="16" type="string">0:system</name>
  <flags length="4">0xFFFFFFFF</flags>
  <flags length="4">0xFFFF</flags>
  <which_flash>0</which_flash>
  <attr>0xFF</attr>
  <attr>0x01</attr>
  <attr>0x00</attr>
  <attr>0xFF</attr>
  <img_name type="string">mcm9607-perf-sysfs.ubi</img_name>
</partition>
</partitions>
</nandboot>
```

The contents between labels <partition> </partition> is the configuration information of one partition: label <name> is the name of this partition. Label <size_kb> is the size of the nand occupied by the partition, the unit is KB, and the size is an integer multiple of 128KB. Label <pad_kb> is the size that this partition uses for redundancy, support 128,512. The other labels attributes can be configured according to the system partition attribute.

So adding a partition only needs to add a <partition> label to the partition_nand.xml configuration file according to the configuration of the other partitions, re-generate a new partition.mbn to replace the one in the firmware package, and download the new firmware. Deleting a partition only need to delete the contents contained by <partition> corresponding label.

The Notes for Partition Adjustment

- 3.2A. Please don't change the partition order.
- B. Please don't delete the partition in the original firmware package, excepting getting the agreement from Quectel.
- C. Please don't change the partition size in the original firmware package, excepting usr_data partition. Meanwhile, for usr_data partition, its partition name and mount point cannot be changed. If FOTA upgrade is required, at least 60M space should be reserved for usr_data partition. If update customers' APP and Quectel firmware at the same time, at least 60M space should be reserved for usr_data partition and customers' APP.
- D. The last partition should be system partition, after modifying please note that whether the partition size reserved for system partition is sufficient, it would fail to load system partition when booting if its space is insufficient, which causing system to continuously restore.
- E. If add customers' APP into system file system, the size of regenerated system ubi could not be larger than 50M. (Or the size of regenerated system ubi should be 6M smaller than system_back partition, and large data could not added into system partition in the later use.)

Partition.mbn Generation

4 Copy the directory partition_make in SDK package to Linux system which already installed related development environment, copy the modified partition_nand.xml to directory partition_make\common\config, then enter directory partition_make\common\build, execute script ./partition_gen.sh (Execute sudo chmod -R 777 ./ to change related permission.). Partition.mbn will be generated under directory partition_make\common\build soon.

NOTE





The proper directory partition_make should be released after March 15, 2018.

Replace Downloading Configuration File of Firehose

5

If customer download firmware by firehose, should update the downloading configuration file of firehose after modifying partition. The detailed method is shown as following.

There are below 4 files in firehose directory in original firmware package.

	partition_complete_p4K_b256K.mbn	2017/11/22 11:32	MBN 文件	16 KB
	patch_p4K_b256K.xml	2017/11/22 11:32	XML 文档	1 KB
	prog_nand_firehose_9x07.mbn	2017/11/22 11:32	MBN 文件	128 KB
	rawprogram_nand_p4K_b256K.xml	2017/11/22 11:32	XML 文档	6 KB

After modifying file partition_nand.xml and generating file partition.mbn, execute the script under directory partition_make\common\build to re-generate above files except file prog_nand_firehose_9x07.mbn. Then replace the other 3 files under directory update/firehose/ with new one. Don't do any operation to file prog_nand_firehose_9x07.mbn.

Then download firmware by firehose in common way.

NOTES

1. The proper directory partition_make should be released after March 15, 2018.
2. The default nand flash for partition_make is 4Gbit nand, pagesize 4k, if the nand flash that customer used is 4Gbit, pagesize 2k, need to replace nand_mbn_generator-4Gbit-2kPagesize.py with file nand_mbn_generator.py.



Add UBI File System

6 Generate New UBI File System

- If customers need to add a new UBI file system, should add a new partition to load this UBI file system firstly, the method already mentioned in the previous chapters. Then need to generate the UBI file system, for the method please refer to *Quectel_AG35-QuecOpen_SDK_Development_Guide*.

Download New UBI File System to Corresponding Partition

- 6.2. ● Download firmware by Qflash
- Add the file to be download in the last line in the label <partition> of file partition_nand.xml. Then copy the image file of UBI file system to firmware package. When download firmware by Qflash tool, this file will be downloaded into corresponding nand partition.

```
<partition>
  <name length="16" type="string">0:usr_data</name>
  <size_kb length="4">126564</size_kb>
  <pad_kb length="4">512</pad_kb>
  <which_flash>0</which_flash>
  <attr>0xFF</attr>
  <attr>0x01</attr>
  <attr>0x00</attr>
  <attr>0xFF</attr>
  <img_name type="string">usrdata.ubi</img_name>
</partition>
```

- 6.3. ● Download firmware by Firehose
- Please refer to Chapter 5.

Load Newly Added UBI File System when System Boot

Execute script EC20FXX_OCPU_SDK\ql-ol-sdk\ql-ol-rootfs\etc\init.d\find_partitions.sh to load file system. Please refer to the code in this script file for the specific implementation method.

```
eval FindAndMountVolume${fstype} usrfs /data // This volume may not exist on MDM9x07.
```

```
eval FindAndMount${fstype} modem /firmware  
#quectel add for usr_data partition mount  
eval FindAndMountUsrdata${fstype} usr_data /usrdata // Start to load usr_data partition added by Quectel.
```

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