Migration Guide - Yaffs2 to UBIFS

AirPrime WP Series

SIERRA WIRELESS®

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Document History

Version	Date	Updates
1.0	November 23, 2016	First version

Contents

1. Overview

This document provides details on how to migrate a target device from a Yaffs file system to a UBIFS file system.

The migration process details are for WP modules with firmware releases older than WPx5xx Release 11 that are upgrading to WPx5xx Release 12 and migrating to UBIFS.

1.1. USER1 File System Options

Beginning with WPx5xx Release 12 (running Legato 16.07), the USER 1 partition filesystem has migrated from Yaffs2 to UBIFS. WPx5xx modules will be factory shipped with UBIFS as the default filesystem in the USER1 partition.

WP modules with firmware release older than Release 12 have the following options:

- *Stay on Yaffs2* –upgrading to WPx5xx Release 12 will not force WP modules' USER1 partition to migrate from Yaffs2 to UBIFS. Sierra Wireless will continue to support Yaffs2 Release 12 functionality so current existing module users can continue to stay on Yaffs2.
- *Migrate to UBIFS* –migrating to UBIFS provides many benefits it brings like the Legato sandbox disk quota feature along with partitioning flexibility.

Note: Future Legato development will be based on the UBIFS filesystem.

1.1. Migration Prerequisites

The procedures in this guide are based on these preconditions USER1 filesystem:

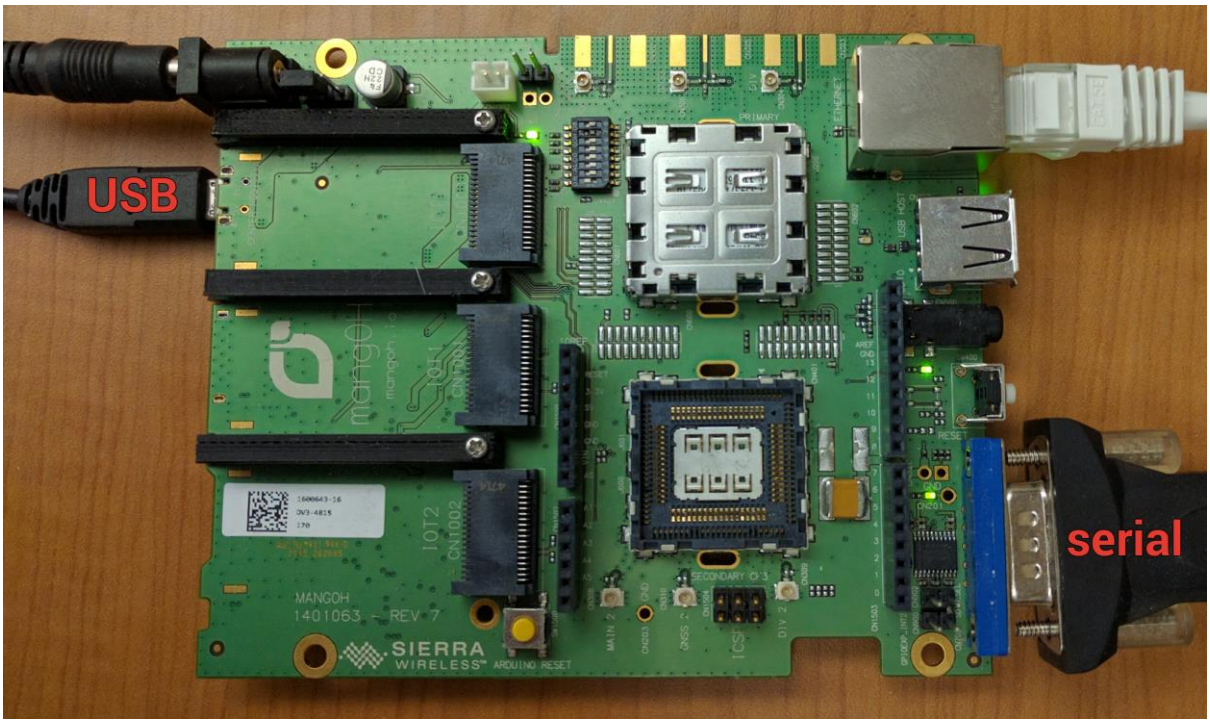
- WPx5xx modules (WP75xx/WP85xx) running Release 12 (with Legato 16.04) or later
- Familiar with command line administrative procedures in Linux/Unix environment
- Access to target device.
- Access to host PC to execute certain target control commands.
- Access to host PC with at least one free USB port and one free serial port.
- Access to host PC through installed terminal program (e.g., TeraTerm on Windows or Minicom on Linux).
- All important customer data from USER1 partition is *backed up before* starting the migration procedure. The same data will be restored to USER1 partition after filesystem migration.

Note: The USER1 partition filesystem migration procedure is destructive; all existing data will be deleted.

2. Migration Procedures

This section outlines a few different ways to upgrade your WPx5xx Release 12 target to UBIFS from Yaffs.

This is a mangOH green board with USB and serial cables connected:



See Legato docs topic on how to configure target/host communications if you need to setup your target and host PC.

2.1. Preparing for Migration

There may be some preparation steps you need to do before running your filesystem migration.

2.1.1. Identify USER1 Partition

If you need to identify your USER1 partition, run this command on your target:

```
root@swi-mdm9x15:/etc# df
```

You'll get a response similar to this:

```
Filesystem           1K-blocks      Used Available Use% Mounted on
devtmpfs                   256         0       256   0% /dev
/dev/ubiblock0_0         25472     25472         0 100% /
mdev                       256         0       256   0% /dev
tmpfs                    75916         0     75916   0% /dev/shm
tmpfs                    75916         0     75916   0% /run
tmpfs                    75916        36     75880   0% /var
tmpfs                    75916        28     75888   0% /tmp
/dev/ubi2_0             115488       496    110156   0% /mnt/flash
/dev/ubiblock1_0          2176      2176         0 100% /mnt/legato
/dev/mtdblock5            5120      1372      3748  27% /mnt/userrw
aufs                    115488       496    110156   0% /etc
aufs                    115488       496    110156   0% /data
/dev/ubi2_0             115488       496    110156   0% /legato
/dev/ubi2_0             115488       496    110156   0% /home
cgroupsRoot                 75916            0         75916       0%
/sys/fs/cgroup
/dev/ubi2_0                115488          496        110156       0%
/legato/systems/current
```

2.1.2. Backup Partition Data

It's extremely important to back up the entire contents of the USER1 partition before starting. You can compress the data, and copy it off of the target device to a safe storage area using your regular backup method.

2.1. Use Developer Studio

If you're running a Windows host PC, you can use Developer Studio's Recovery Wizard menu to reset/erase the USER1 partition with this command:

```
wipe_mntflash_wp85.cwe
```

2.2. Use swiflash Tool

If you're running a Linux host PC, you can use the `swiflash` tool to reset the USER1 partition that will also upgrade your file system from Yaffs to UBIFS:

- Go to the Sierra Wireless Source swiflash page.
- Follow the instructions to install `swiflash.`
- Use the reset command to upgrade the USER1 partition on a Legato device:
  `swiflash -m WP85XX -r`

  The `-r` option erases the USER1 partition (all filesystem updates will be lost). If the filesystem `yaffs2` is detected, it will be updated to `ubifs`.

The response should then be:

```
Target system is now ready for USER1 partition data restore.
```

2.3. Use fastboot Tool

If you're running a Linux host PC, you can use `fastboot` tool to reset the USER1 partition that will also upgrade your file system from Yaffs to UBIFS.

You need to have `fastboot`, `adb` and other tools installed on your host PC. Currently, you need to download and install the full Android Studio bundle on your host PC to access the required tools:

- Download Android Studio from http://developer.android.com/sdk/index.html.
- Follow Google's installation instructions.
- Start Android Studio, and add `platform-tools` directory to your PATH.
- Ensure the host and target systems are connected properly using USB and serial cables.
- Boot the target device and log on. Start a terminal console, and enter this command:

  ```
  sys_reboot bootloader
  ```

- Wait for this response in your terminal:

  ```
  Android Bootloader - UART_DM Initialized!!!h command 'bootloader'
  [50] udc_start()
  ```

- Your target is now ready to receive `fastboot` commands.
- Ensure the host PC can communicate with the target (see mangOH documentation for details). Then open a terminal on the host PC, and enter:

  ```
  fastboot devices
  ```

- The response should be:

  ```
  MDM9615 fastboot
  ```

  If you don't see this response, you may need to check the USB connection between host PC and target is working properly (re-attach USB cable or rebooting may resolve this).

- Enter the following command on the host terminal:

  ```
  fastboot erase user1
  ```

- The response should then be:

  ```
  erasing 'user1'...
  OKAY [  0.575s]
  finished. total time: 0.575s
  ```

- After the USER1 files erasing has finished, enter this command on the host PC terminal:

```
fastboot reboot
```

- The host PC should respond with:

```
rebooting...
finished. total time: 0.252s
```

- After the ‘finished’ response, the target device should reboot. The following response will display indicating successful file system upgrade:

```
S02mount_early: Executing mount_early_user_start...
S02mount_early: Trying to mount UBIFS on /mnt/flash using [usrquota,grpquota,rw]
mount options.
UBI device number 2, total 1116 LEBs (141705216 bytes, 135.1 MiB), available 1032
LEBs (1310392
32 bytes, 125.0 MiB), LEB size 126976 bytes (124.0 KiB)
libubi: error!: cannot get information about "/dev/ubi2_0"
        error 2 (No such file or directory)
ubiblkvol: error!: error while probing "/dev/ubi2_0"
           error 2 (No such file or directory)
S02mount_early: Unable to use ubi2 partition 0
S02mount_early: Trying to mount UBIFS on /mnt/flash using [rw] mount options...
UBI device number 2, total 1116 LEBs (141705216 bytes, 135.1 MiB), available 1032
LEBs (1310392
32 bytes, 125.0 MiB), LEB size 126976 bytes (124.0 KiB)
libubi: error!: cannot get information about "/dev/ubi2_0"
        error 2 (No such file or directory)
ubiblkvol: error!: error while probing "/dev/ubi2_0"
           error 2 (No such file or directory)
S02mount_early: Unable to use ubi2 partition 0
S02mount_early: YAFFS2 file system on user1 partition is empty, forcing it to be
UBIFS.
Erasing 128 Kibyte @ 8b60000 -- 100 % complete
ubiformat: mtd4 (nand), size 146276352 bytes (139.5 MiB), 1116 eraseblocks of 131072
bytes (128
.0 KiB), min. I/O size 2048 bytes
libscan: scanning eraseblock 1115 -- 100 % complete
ubiformat: 1116 eraseblocks are supposedly empty
ubiformat: formatting eraseblock 1115 -- 100 % complete
UBI device number 2, total 1116 LEBs (141705216 bytes, 135.1 MiB), available 1032
LEBs (1310392
32 bytes, 125.0 MiB), LEB size 126976 bytes (124.0 KiB)
S02mount_early: Making single volume, size 124MiB on UBI device number 2...
Volume ID 0, size 1024 LEBs (130023424 bytes, 124.0 MiB), LEB size 126976 bytes
(124.0 KiB), dy
namic, name "user1_vol0", alignment 1
S02mount_early: Trying to mount UBIFS on /mnt/flash using [usrquota,grpquota,rw]
mount options.
..
UBI device number 2, total 1116 LEBs (141705216 bytes, 135.1 MiB), available 8 LEBs
(1015808 by
tes, 992.0 KiB), LEB size 126976 bytes (124.0 KiB)
S02mount_early: Performing quota check on file system mounted at /mnt/flash
S02mount_early: UBIFS volume successfully mounted on /mnt/flash
```

The target device is now ready for USER1 partition data restore.