M480 Dual Bank Update Operation

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	Dual Bank firmware update sample code
BSP Version	M480 Series BSP CMSIS V3.04.000
Hardware	NuMaker-ETM-M487

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1 Function Description

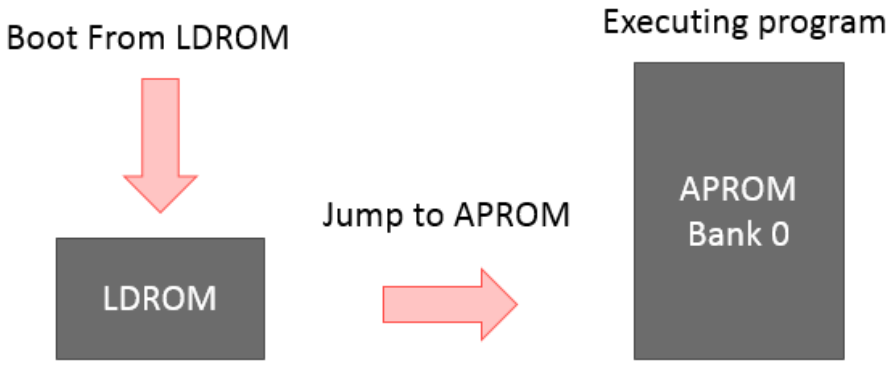
1.1 Introduction

This example code shows how to update firmware which doesn't need to stop program execution

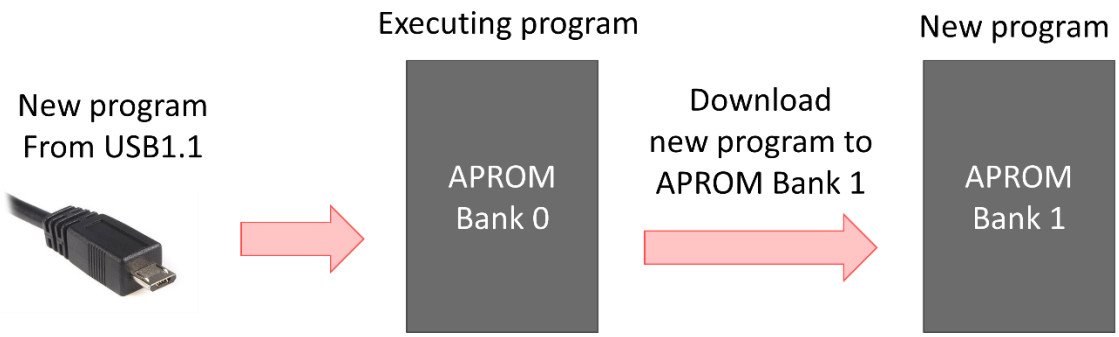
1.2 Principle

- **Boot from LDROM to check where the newest firmware in**
  - If APROM Bank0 has the newest firmware, jump to APROM bank0 and execute.
  - If APROM Bank1 has the newest firmware.
    - Copy it to APROM bank0.
    - Jump to APROM bank0 and execute.
- **Firmware will be executing in APROM Bank 0**
- **User can use ISP tool to update Firmware by USB 1.1**
- **The updated Firmware will be stored at APROM bank1**
- **M480 will be boot from LDROM after reset.**
- **The firmware in LDROM will update the newest Firmware from APROM bank1 to APROM bank0 and executing APROM bank0 firmware.**

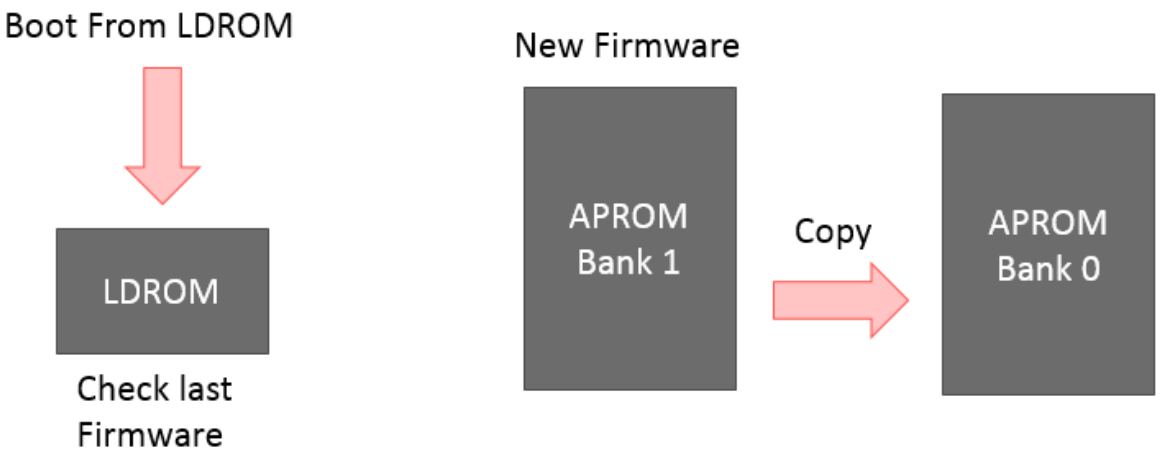
1. Normal operating flow:



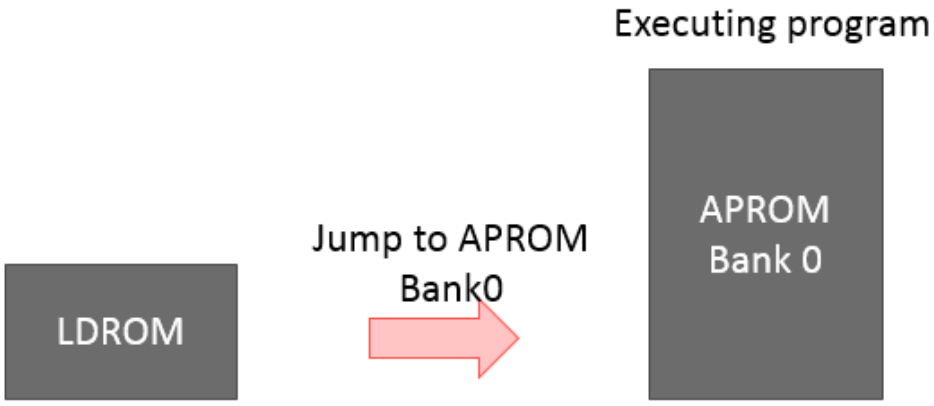
2. Update firmware:



3. Reset M480 to update firmware:



4. After updated:



1.3 Demo Result

Flash Bank 0 will be updated.

2 Code Description

```
int main()
{
        uint32_t BANK0_Version;
        uint32_t BANK1_Version;

    SYS_Init();                         /* Init System, IP clock and multi-function I/O */

    UART0_Init();                       /* Initialize UART0 */
    /*---------------------------------------------------------------------------*/
    /* SAMPLE CODE                                                               */
    /*---------------------------------------------------------------------------*/

    SYS_UnlockReg();                    /* Unlock register lock protect */

    FMC_Open();                         /* Enable FMC ISP function */
        FMC_ENABLE_AP_UPDATE();

        BANK1_Version = FMC_Read(BANK1_Version_CTL);
        BANK0_Version = FMC_Read(BANK0_Version_CTL);

        if(BANK1_Version==0xFFFFFFFF)
        {
            JumpAPROMBank0();
            //printf("BANK1= %d, BANK0= %d\n", BANK1_Version, BANK0_Version);
        }
        else if (BANK1_Version > BANK0_Version)
        {
            UpdateAPROMBank0();
            //printf("BANK0= %d, BANK1= %d\n", BANK0_Version, BANK1_Version);
        }
        JumpAPROMBank0();

        while(1);

}
```

3 Hardware and Software environment

- **Software Environment**
  - BSP version
    - M480 Series BSP CMSIS V3.04.000
  - IDE version
    - Keil uVersion 5.26
- **Hardware Environment**
  - Circuit components
    - NuMaker-ETM-M487
  - Diagram
    - N/A

4 Directory Information

- EC_M480_Dual_Bank_Update_Operation_V1.00
  - Library — Sample code header and source files
    - CMSIS — Cortex® Microcontroller Software Interface Standard (CMSIS) by Arm® Corp.
    - Device — CMSIS compliant device header file
    - StdDriver — All peripheral driver header and source files
  - SampleCode
    - ExampleCode — Source file of example code

5 How to execute a sample code

1. Enter Keil compile mode
    a. Build
    b. Download
    c. Start/Stop debug session
2. Enter debug mode
    a. Run

6 Revision History

Date	Revision	Description
Nov 14, 2019	1.00	1. Initially issued.

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