Application Report
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Sharing FEE Blocks Between the Bootloader and the Application

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ABSTRACT

This application note describes how to share FEE blocks between the bootloader and the application. In a normal use case, the bootloader is not updated frequently, while the application is updated often.

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1 Problem

If the application is changing often, and if it is sharing some FEE blocks with the bootloader, the bootloader must change along with application (because the bootloader must know how many blocks the application has configured). To avoid this scenario, the bootloader can be configured to copy all the blocks which it does not configure, but which are configured by the application. Figure 1 shows how blocks are arranged for sharing between the bootloader and the application.

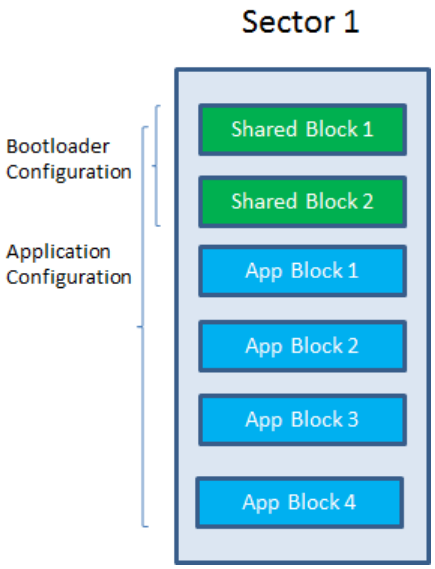

Figure 1. Blocks in a Sector

If there is a sector swap in the bootloader, it may fail to copy the application blocks to the new sector, as shown in Figure 2.

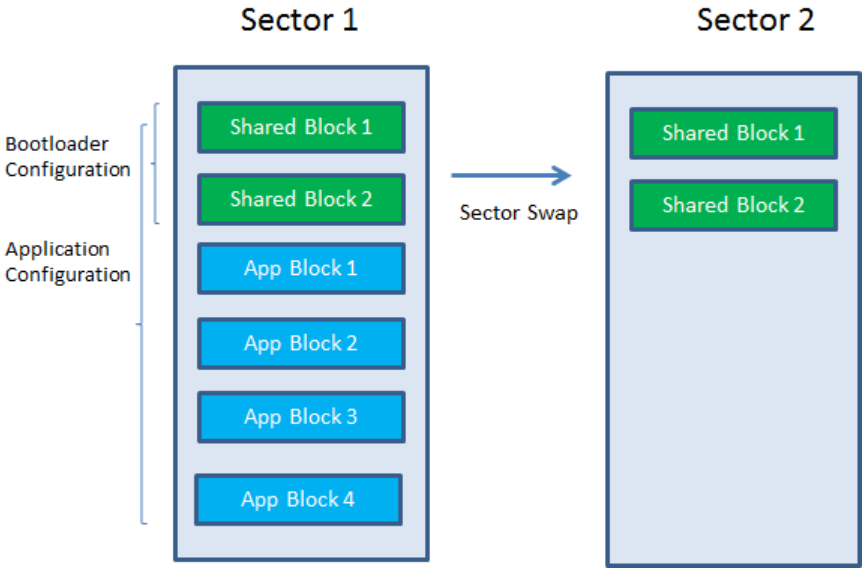

Figure 2. Incorrect Sector Swap

NOTE: If the application and the bootloader are using same number of blocks (for example, Shared Block 1, Shared Block 2, and no App Blocks), both of them should use the same FEE configuration.

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2 Solution

The problem described above ss addressed by following steps:

1. Configure two blocks for the bootloader FEE configuration.
2. Configure six blocks for the application FEE configuration.
3. Configure the bootloader FEE configuration such that the FEE_NUMBER_OF_UNCONFIGUREDBLOCKSTOCOPY(TI_FEE_NUMBER_OF_UNCONFIGUREDBLOCKSTOCOPY if HALCoGen FEE driver is used) is configured to 4, and configured to a value of FEE_TOTAL_BLOCKS_DATASETS in the application FEE configuration, as shown in Figure 3.

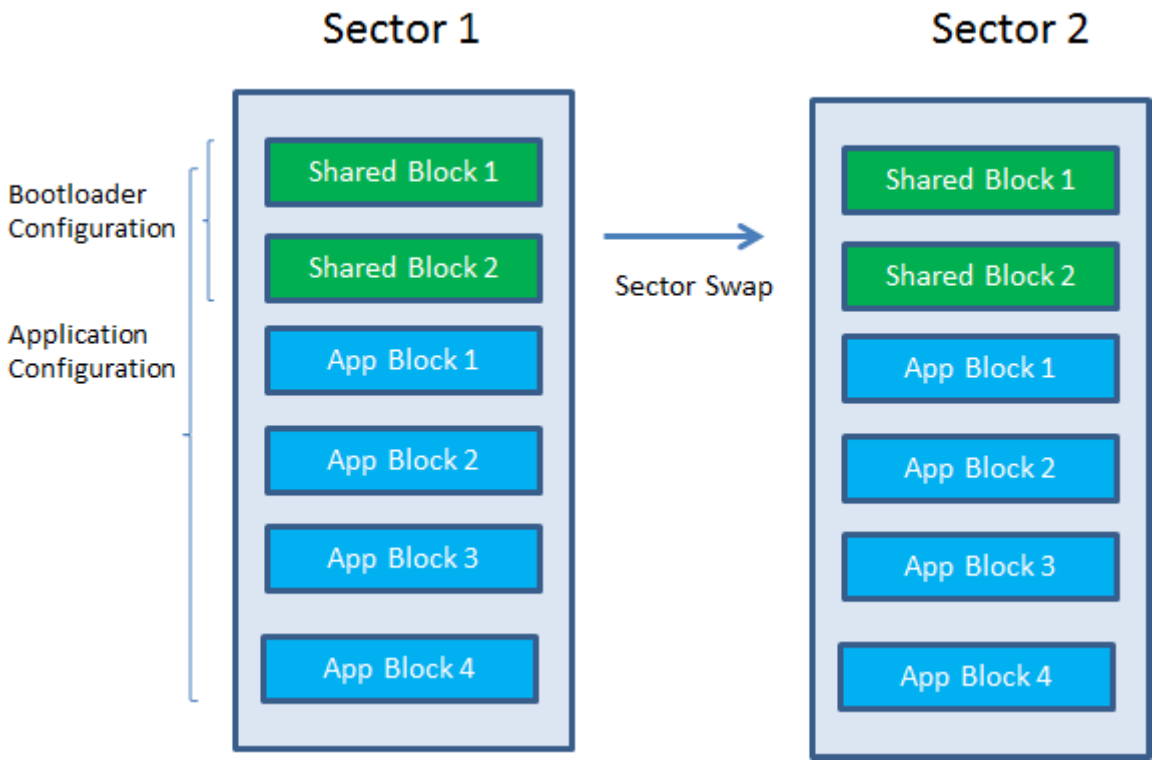

Figure 3. Correct Sector Swap

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4. Use the configuration parameters shown in Figure 4 in EBTresos, if the autosar FEE driver is used.

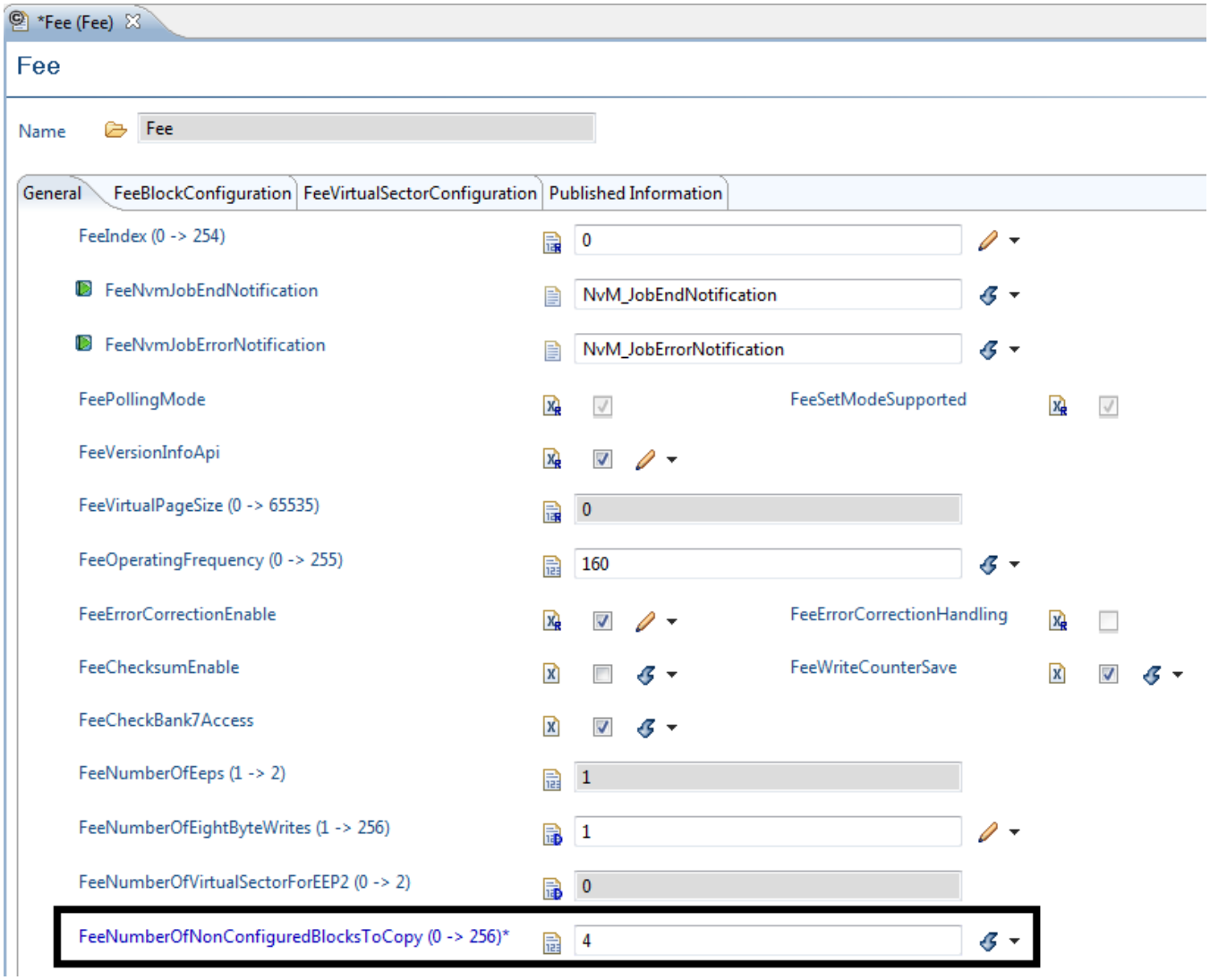

Figure 4. EBTresos Configuration Parameters

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5. Use the configuration parameters shown in Figure 5 in HALCoGen, if a TI FEE driver is used.

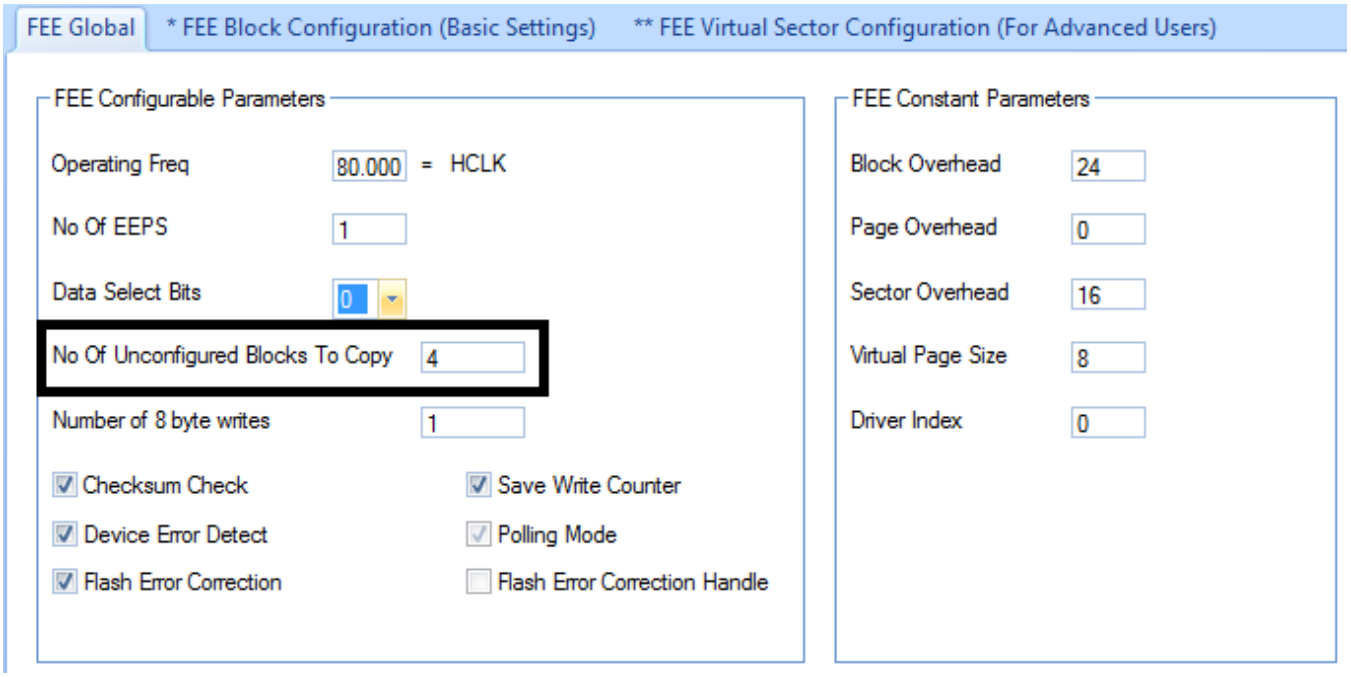

Figure 5. HALCoGen Configuration Parameters

6. The bootloader can configure FEE_NUMBER_OF_UNCONFIGUREDBLOCKSTOCOPY to a maximum value 256. This allows the bootloader to copy 256 application blocks to a new sector, when a sector switch happens in the bootloader. This parameter should be configured carefully, because each count of this macro requires 3 bytes of RAM.

3 References

http://www.ti.com/tool/HALCOGEN

http://processors.wiki.ti.com/index.php/TI_FEE

4 Abbreviations

EEPROM – Electrically-erasable programmable read-only memory

FEE – Flash EEPROM emulation

HALCoGen – Hardware abstraction layer code generator

AUTOSAR – Automotive open system architecture

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