

STM32 Secure Patching Bootloader Enhancement for Multiple Segment Support

The problem this solution addresses is how to leverage the stm32-secure-patching-bootloader security and robustness features to update bundled application and resources that are not located in a contiguous region in flash.

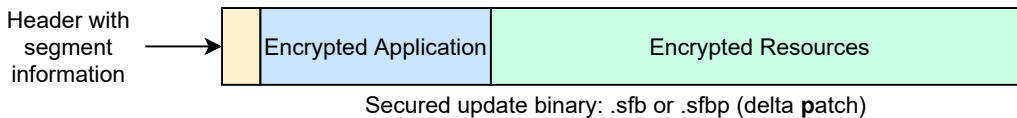
This solution solves the problem by adding additional information to the update image header and additional capability into the bootloader and firmware image preparation tools to generate and process the additional header fields. The "dual image" update method is otherwise retained. The diagrams below explain how the process works. The enhanced firmware processing flow generates a single Intel Hex format manufacturing image containing the discontinuous segments without wasteful fill bytes, as binary format would.

This solution is specifically designed for updating TouchGFX GUI assets located in QSPI flash. It can also be used to place download SLOT 1 into external flash to support larger application binaries.

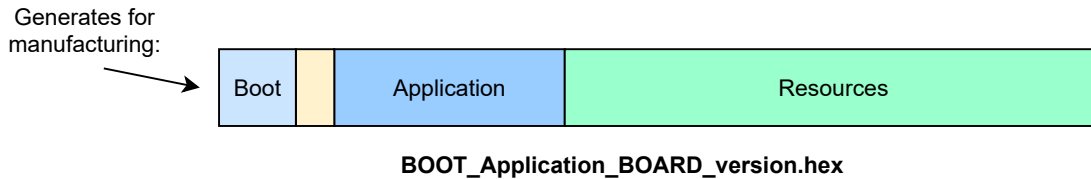
1. Toolchain generates combined application ELF with application and other resources.



2. Firmware preparation tools process ELF and finds discontinuous segments. Segment information is built into the firmware update file header in the generated update images(.sfb or sfbp). Compatible with the Delta Patch module.



3. Firmware preparation tools generate the combined manufacturing image in Intel Hex format. One image for all segments, including the data destined for QSPI. This format is supported by STM32CubeProgrammer and others.



Example Layout: STM32F7 with QSPI flash. Resources segment is mapped into beginning of QSPI. Download SLOT 1 is placed after, also in QSPI. Application segment must fit into device internal memory to retain the secure features of the bootloader.

