SCU_Reset_Detection_1 for KIT_AURIX_TC334_LK
Detection of reset type
Scope of work

This example shows how to detect the source of the last reset (power-on reset, watchdog reset, etc.)

The AURIX™ TC3xx devices can be reset by various reset sources. The application software is able to determine the source of the last reset based on a routine that evaluates the related reset special function registers. According to the type of reset, one or two LEDs are switched on.
Introduction

- Resets can be configured and determined in the Reset Control Unit (RCU), belonging to the System Control Unit (SCU)

- Various reset triggers are available, such as:
  - Supply Monitor
  - Embedded Voltage Regulators (EVRs)
  - Power-On Reset (PORST)
  - External Service Request (ESRx)
  - Debug interface

- Consequently, different reset types can be derived, such as:
  - Cold-/Warm-Power-On Reset
  - System Reset
  - Application Reset
  - Debug Reset
  - Module Reset
Hardware setup

This code example has been developed for the board KIT_A2G_TC334_LITE.
Implementation

Reset Detection

To get information about the last occurred reset, the function `IfxScuRcu_evaluateReset()` is called inside `detectResetSource()`. The returned value is a data structure comprising elements such as `resetType` and `resetTrigger`.

- The `resetType` specifies the type of the last reset (e.g. Cold Power-On Reset, System Reset, Application Reset or Warm Power-On Reset)

- The `resetTrigger` specifies the source of the last reset. For instance, the source can be a Power-On Reset (pressing the PORST-Button), a SW triggered reset or a reset triggered by the debugger or any voltage supervision monitor

The function `IfxScuRcu_evaluateReset()` evaluates both the `RSTSTAT` and `RSTCON` registers

- The `RSTSTAT` register is evaluated with regard to which reset bits are set, respectively, cleared. Firstly, the warm reset status bits comprising `ESRx, SMU, SW, STMx` and `CBx` are evaluated. Secondly, the cold reset status bits comprising `EVRC, EVR33, SWD` and `STBYR` are evaluated if none of the warm reset status bits are set. Finally, the `PORST` bit is evaluated

- The `RSTCON` register is evaluated to determine the type of reset based on the trigger configuration
Reset Detection (cont.)

Based on the `resetType` of the `lastReset`, LED1, LED2 or both are switched on.

Furthermore, the function `detectResetSource()` clears the Cold Power-On sticky bits using the function `IfxScuRcu_clearColdResetStatus()`. Those bits are not cleared automatically and must be explicitly cleared by the application.

The functions `IfxScuRcu_evaluateReset()` and `IfxScuRcu_clearColdResetStatus()` can be found in the iLLD header `IfxScuRcu.h`. 
Implementation

Reset Trigger

The function `triggerSwReset()` triggers either a software Application Reset or a software System Reset, depending on the macro `RESET_SRC` given as parameter.

To trigger a software reset, the request trigger in the Reset Configuration Register must be configured first. This is done through the function `IfxScuRcu_configureResetRequestTrigger()`.

Then, the CPU EndInit protection is cleared with the function `IfxScuWdt_clearCpuEndinit()` and the software reset is triggered calling `IfxCpu_triggerSwReset()`.

Finally, the CPU EndInit protection should be set again, but this instruction cannot be reached since a software reset is triggered right before.

The function `IfxScuRcu_configureResetRequestTrigger()` can be found in the iLLLD header `IfxScuRcu.h`.

The function `IfxScuWdt_clearCpuEndinit()` can be found in the iLLLD header `IfxScuWdt.h`.

The function `IfxCpu_triggerSwReset()` can be found in the iLLLD header `IfxCpu.h`.
Run and Test

After code compilation and flashing the device, press the PORST button (4) and observe the following behavior:

› Both LED1 (1) and LED2 (2) are turned on for 500 ms because a Warm Power-On reset is detected
› Then, the board is reset by software, therefore the LED3 (3) is blinked once
› Finally, depending on the last occurred reset (given by the `RESET_SRC` macro) the LED1 (1) or the LED2 (2) is turned on

The `RESET_SRC` macro is firstly set to `APPLICATION_RESET`. To trigger a system reset, change it to `SYSTEM_RESET`, re-flash the code, press the PORST button (4) and check that LED2 (2) is switched on after both LED1 (1) and LED2 (2).

**Note:** To observe the correct behavior of this example, use the Flash button. This ensures that the project is flashed on the board without triggering the debugger.
References

› AURIX™ Development Studio is available online:
  › [https://www.infineon.com/aurixdevelopmentstudio](https://www.infineon.com/aurixdevelopmentstudio)
  › Use the „Import…“ function to get access to more code examples.

› More code examples can be found on the GIT repository:
  › [https://github.com/Infineon/AURIX_code_examples](https://github.com/Infineon/AURIX_code_examples)

› For additional trainings, visit our webpage:
  › [https://www.infineon.com/aurix-expert-training](https://www.infineon.com/aurix-expert-training)

› For questions and support, use the AURIX™ Forum:
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