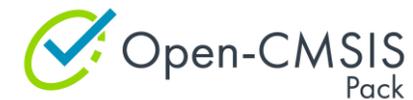


Open-CMSIS-Pack

Technical Project Meeting 2021-10-19

This meeting is recorded !



Agenda

- CMSIS-Zone for ST use cases [Jonatan]
- Revisiting 'projmgr'
- Open Topics
- Ongoing Activities
- Wrap Up

CMSIS-Zone for ST use cases

1. sequential execution contexts and memory re-use

Name	Permis...	Size	Start	End	blinky_s	blinky_ns	blinky_alone	Info
STM32L552ZETxQ								ARM, 384 KB RAM, 1 MB ROM
Memory								
Flash_NS	rx,n	512 KB	0x08000000	0x0807FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CODE_NS	rx,n	256 KB	0x08040000	0x0807FFFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Non-secure FLASH for CODE executi
Flash_S	rx,c	512 KB	0x0C000000	0x0C07FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CODE_S	rx,s	248 KB	0x0C000000	0x0C03DFFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Secure FLASH for CODE execution
Veneer	rx,c	8 KB	0x0C03E000	0x0C03FFFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Secure FLASH for CODE Veneer table
SRAM_NS	rw,n	256 KB	0x20000000	0x2003FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DATA_NS	rw,n	128 KB	0x20000000	0x2001FFFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Error Z106: memory:DATA_NS: Memc
SRAM_NS_Blinky_Alone	rw,n	256 KB	0x20000000	0x2003FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Memory region in NS, to be used by
SRAM_S	rw,c	256 KB	0x30000000	0x3003FFFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DATA_S	rw,s	128 KB	0x30000000	0x3001FFFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Error Z106: memory:DATA_S: Memon

Error from auto-alignment

Generation of different SAU setups required

2. using the MPU within an execution context

Zone setup

Name: blinky_ns
Security: Non-secure
Privilege: not specified
Resource file: blinky_ns.rzone
Info:

Creator
Tool: CMSIS-Zone Plugin for Eclipse 1.1.0
Input resources: ../STM32L5.rzone
Input assignments: ../STM32L5.azone

Mode
 Project allocates resources to project zones
generates MPC and SAU settings
 Execution assigns resources to execution zones
generates MPU table

Options
RAM: show select
ROM: show select
Peripherals: show select

MPU needs Execution Mode

MPUv8 template missing

sequential execution contexts and memory re-use

Additional top level zones ...

... with shared/overlapping regions

Name	Permissions	Size	Start	End	bootloader	app	Info
STM32L552ZETxQ							ARM, 384 KB RAM, 1 MB ROM
Memory							
Flash_NS	rx,n	512 KB	0x08000000	0x0807FFFF	<input type="checkbox"/>	<input type="checkbox"/>	
app_ns	rx,n	384 KB	0x08020000	0x0807FFFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Warning Z107: memory:app_ns: Memory region fully
Flash_S	rx,c	512 KB	0x0C000000	0x0C07FFFF	<input type="checkbox"/>	<input type="checkbox"/>	
boot	rx,s	128 KB	0x0C000000	0x0C01FFFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
app_s	rx,c	384 KB	0x0C020000	0x0C07FFFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Warning Z107: memory:app_s: Memory region fully o
SRAM_NS	rw,x,n	256 KB	0x20000000	0x2003FFFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
SRAM_S	rw,x,c	256 KB	0x30000000	0x3003FFFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Peripherals							
ADC							
DMA							Direct memory access controller
GPIO							General-purpose I/O Ports
I2C							
LTIM							
OctoSPI							
SAI							
SPI							
TIM							
UCPD							
USART							
FDCAN1	rw	3 KB	0x4000A400	0x4000AFFF	<input type="checkbox"/>	<input type="checkbox"/>	CAN / CAN FD

using the MPU within an execution context

The 'Zone setup' dialog shows the following configuration:

Zone	Creator
Name: blink_ns	Tool: CMSIS-Zone Plugin for Eclipse 1.1.0
Security: Non-secure	Input resources: ../STM32L5.rzone
Privilege: not specified	Input assignments: ../STM32L5.azone
Resource file: blink_ns.rzone	
Info:	

Mode

- Project: allocates resources to project zones, generates MPC and SAU settings
- Execution**: assigns resources to execution zones, generates MPU table

Options

- RAM: show select
- ROM: show select
- Peripherals: show select

Mode set to Execution

The 'CMSIS Zone Properties' dialog shows the following configuration:

- Name: Exec1
- Device: STM32L55ZETxQ
- Security: Non-Secure
- Privilege: Unprivileged
- Info: (empty)

Buttons: OK, Cancel

Zones need to be unprivileged

```
1 <#compress>
2 <#include "helper.ftlinc"/>
3 </#compress>
4 /*
5 * MPU Table Source File generated by CMSIS-Zone
6 */
7
8 #include "mputable.h"
9
10 const ARM_MPU_Region_t mpuTable[ $\{zname\}$ ?filter(x -> x.priv
11 {<#rt>
12 <#list zone?filter(x -> x.privilege.u == "1") as z<#rt>
13 <#lt> /* Execution Zone ' $\{z.name\}$ ' */
14 <#list z.mpu_setup.region as r>
15 //  $\{r.info\}$  ( $\{r.start\}$ .. $\{r.end\}$ )
16 { .RBAR = ARM_MPU_RBAR( $\{r.start\}$ ),  $\{r.shared == '1'\}$ ?
17 <#lt>.RLAR = ARM_MPU_RLAR( $\{r.end\}$ , 0) }<#rt>
18 <#lt>#sep>,
19 </#list><#rt>
20 <#list z.mpu_setup.region?size..!&><#lt>,
21 <#items as r>
22 { .RBAR = 0u, .RLAR = 0u }<#sep>,
23 </#items>
24 </#list>
25
26 <#sep>,
27 <#lt>},<#rt>
28 </#list>
29 }};
30
```

MPUv8 template required

‘projmgr’

- Fork: <https://github.com/brondani/devtools/tree/mvp-prototype/tools/projmgr>
- Feedback
 - Add to PR: <https://github.com/brondani/devtools/pull/1>
 - **Action all:**
provide feedback on “nodes” and “tags” proposed [here](#).
- Planned before merging PR:
 - Adding tests
 - Code restructuring
- Investigate:
 - Definition of the YAML Schema
 - Retaining formatting and comments when writing YAML
 - Alternative syntax for component reference
 - Alternative syntax for specifying with wildcards / regexp

Open Topics

- Multi-Context Terminology & Concepts ([#33](#))
 - NXP feedback – complexity -> can we simplify ?
- Template Engines ([#32](#))
 - Conclude GAP analysis (Feature: evaluation language)
 - Comparison of template example (ease and scalability)
- Outstanding extensions to CMSIS-Pack specification
 - Address once documentation and schema moved
- Lockfile versus CPRJ file variant
- Extensible search path for packs / pack filter option

Ongoing Activities

- Migrate CMSIS-Pack docs to Open-CMSIS-Pack
- Update Glossary
(<https://github.com/Open-CMSIS-Pack/Open-CMSIS-Pack/wiki/Glossary>)
- Integrate cpackget with buildmgr
 - Added support for license gating/acceptance
 - Add support for packlist file
 - Add support for updating index.pidx
- Arm prepares contribution of PackChk to 'devtools' repository

Wrap Up

- Please suggest agenda points ahead of the next meeting
- FYI:
 - AWS has used 'packgen' to generate and publish 16 CMSIS-Packs:
 - [AWS.pidx](#)
- Next Open-CMSIS-Pack meeting: 26. Oct. 2021 @ 16:00 (15:00 UK)

Thank you

