FreeRTOS on RISC-V

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Agenda

The FreeRTOS Kernel

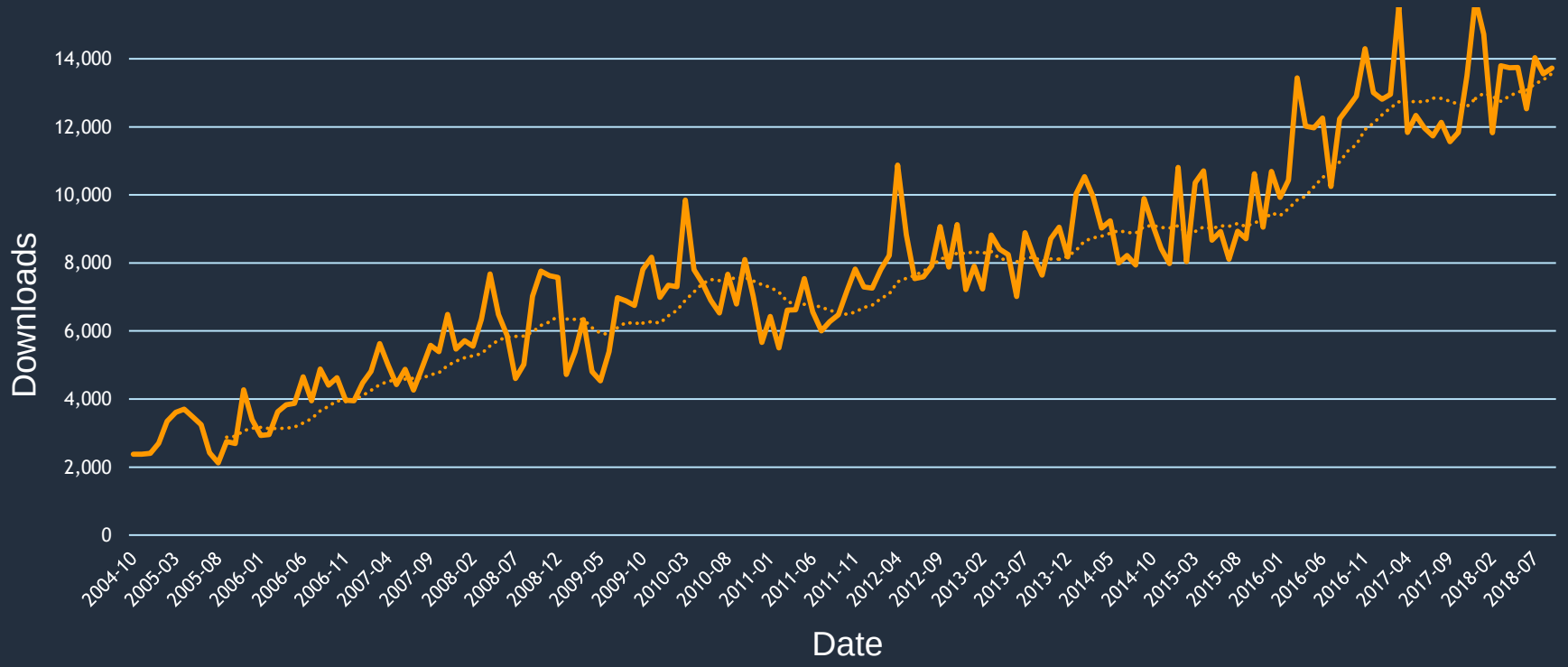
Running FreeRTOS on RISC-V

FreeRTOS—Open source real time kernel

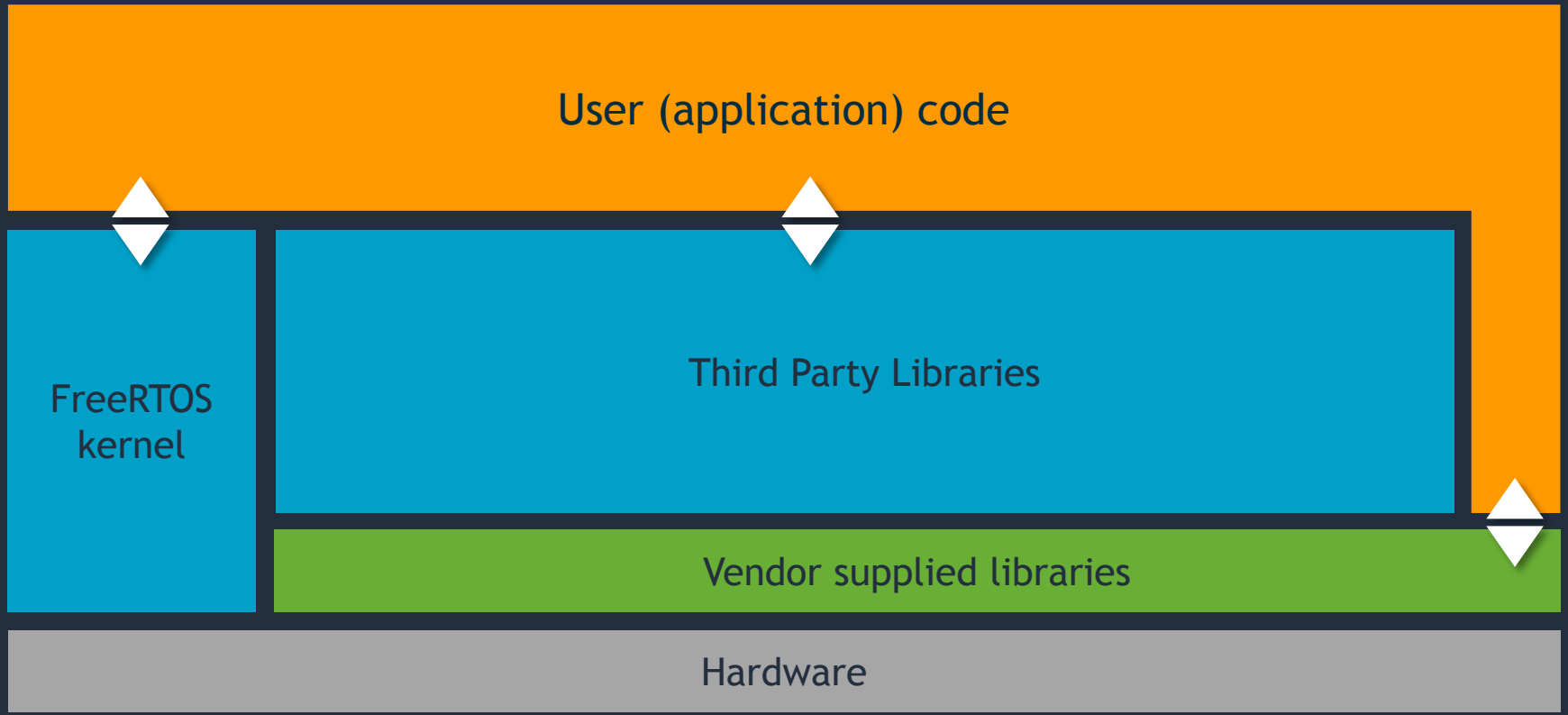
is everywhere…

FreeRTOS downloads per month over 15 years

Official RISC-V port released February 2019

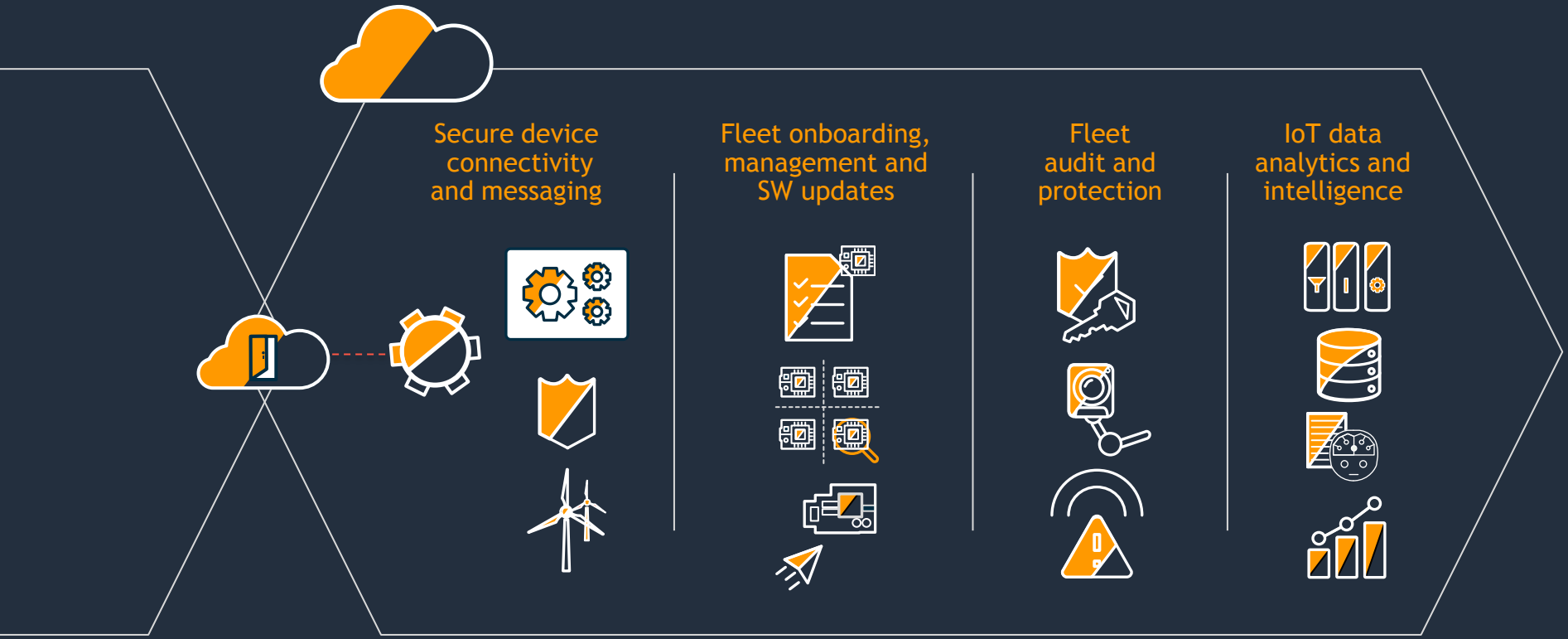


FreeRTOS kernel



Use cases

Recent trend - IoT

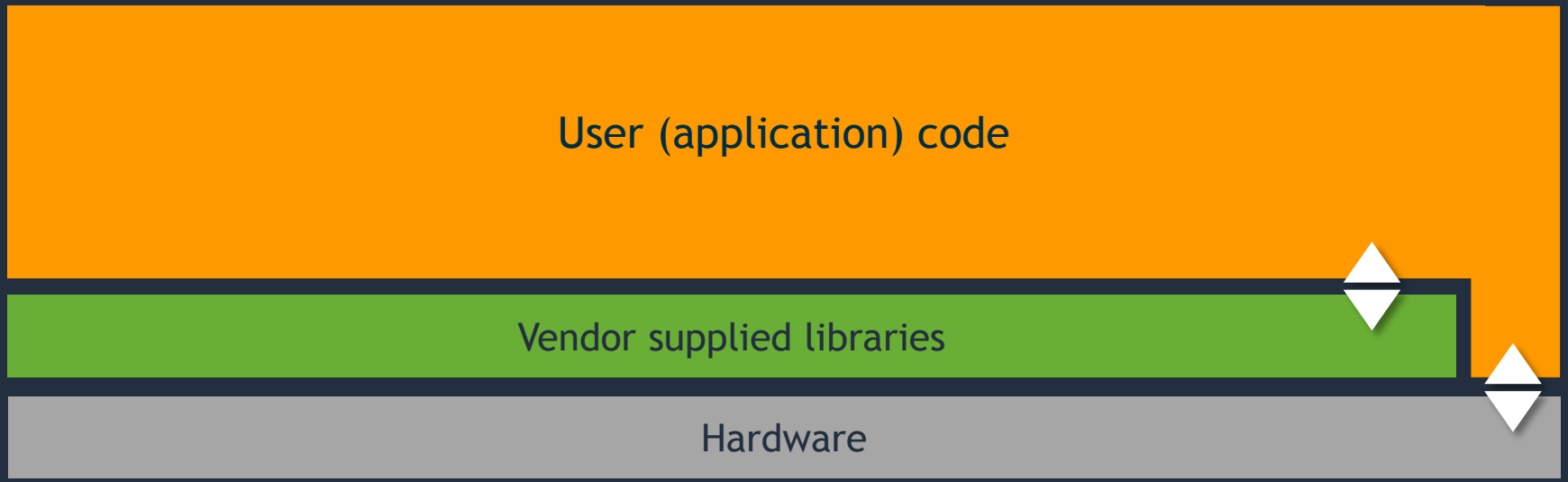


Intelligence

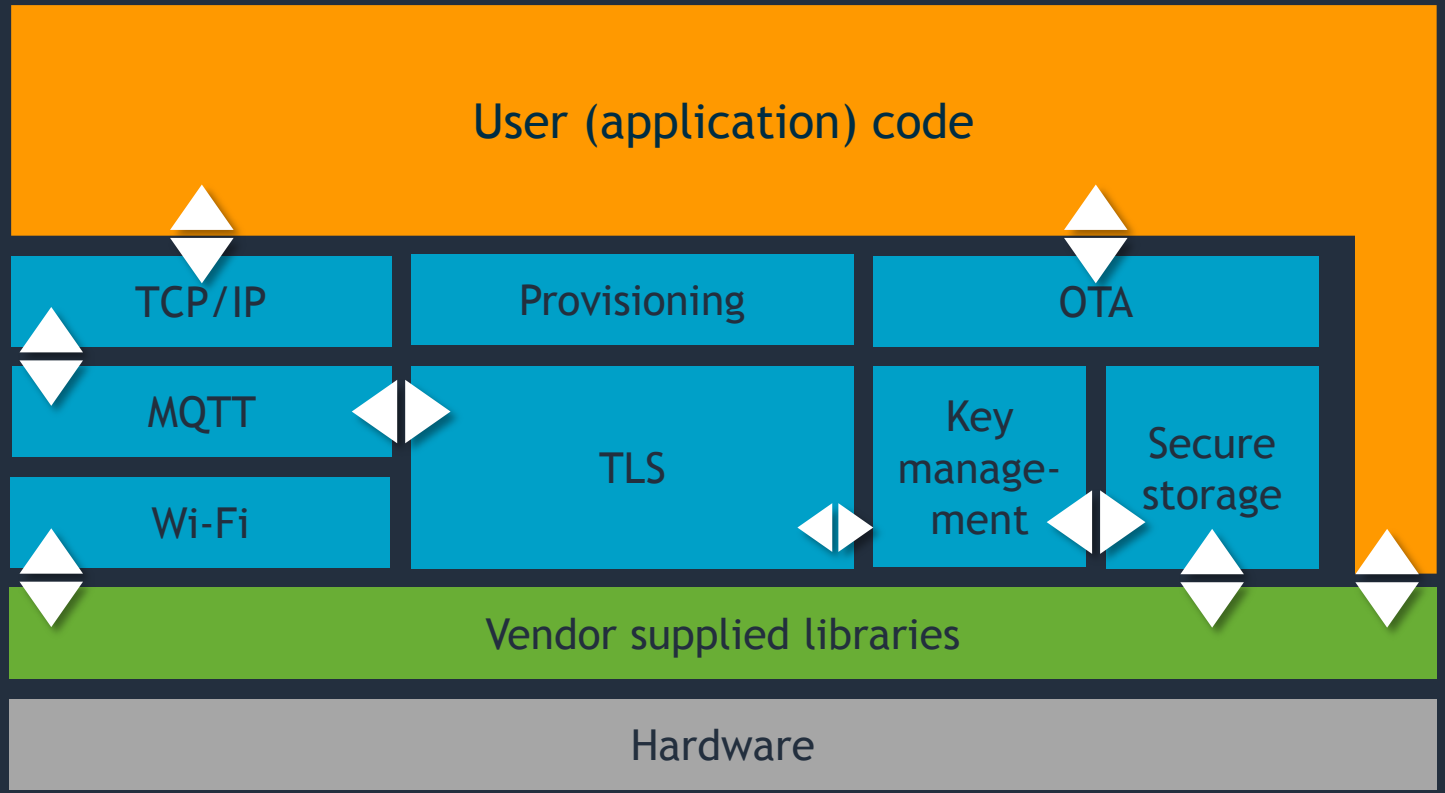
Insights & Logic → Action

aws

Bare metal, assembly or C



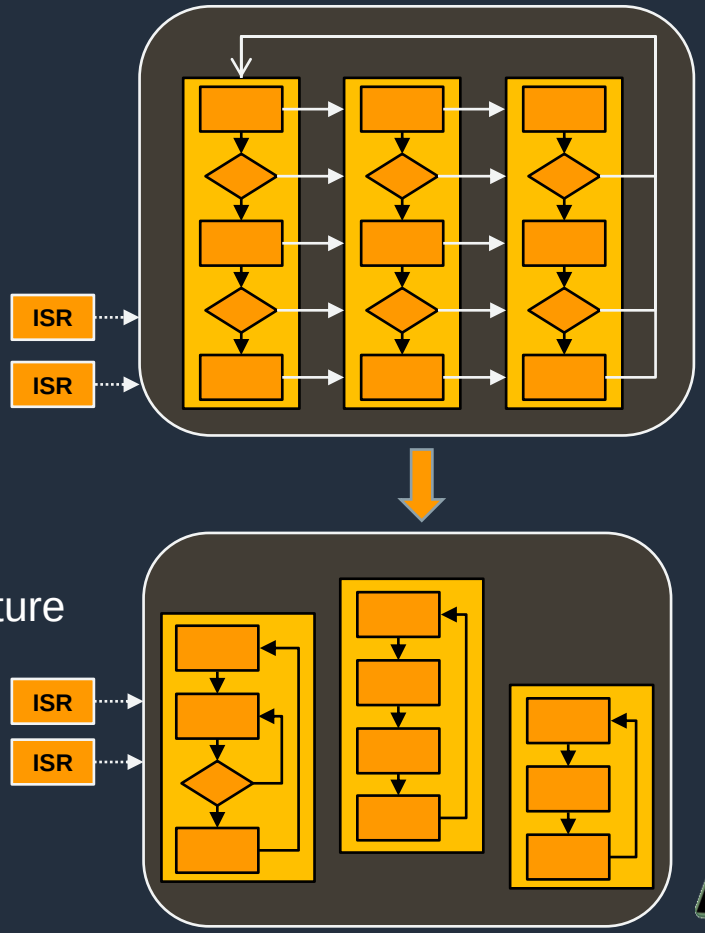
Application view with individual libraries



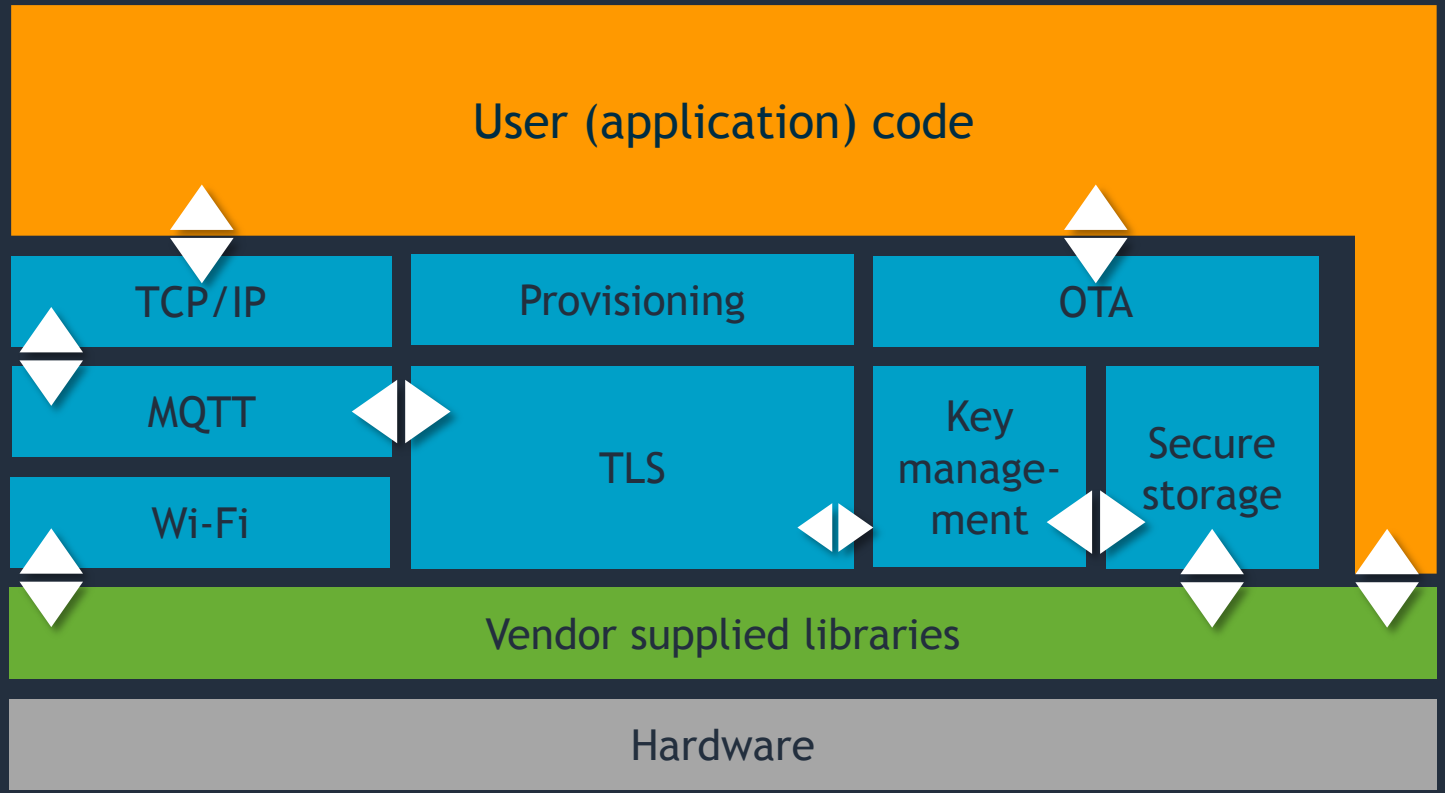
Introducing a library that implements multithreading

Application Design Goals:

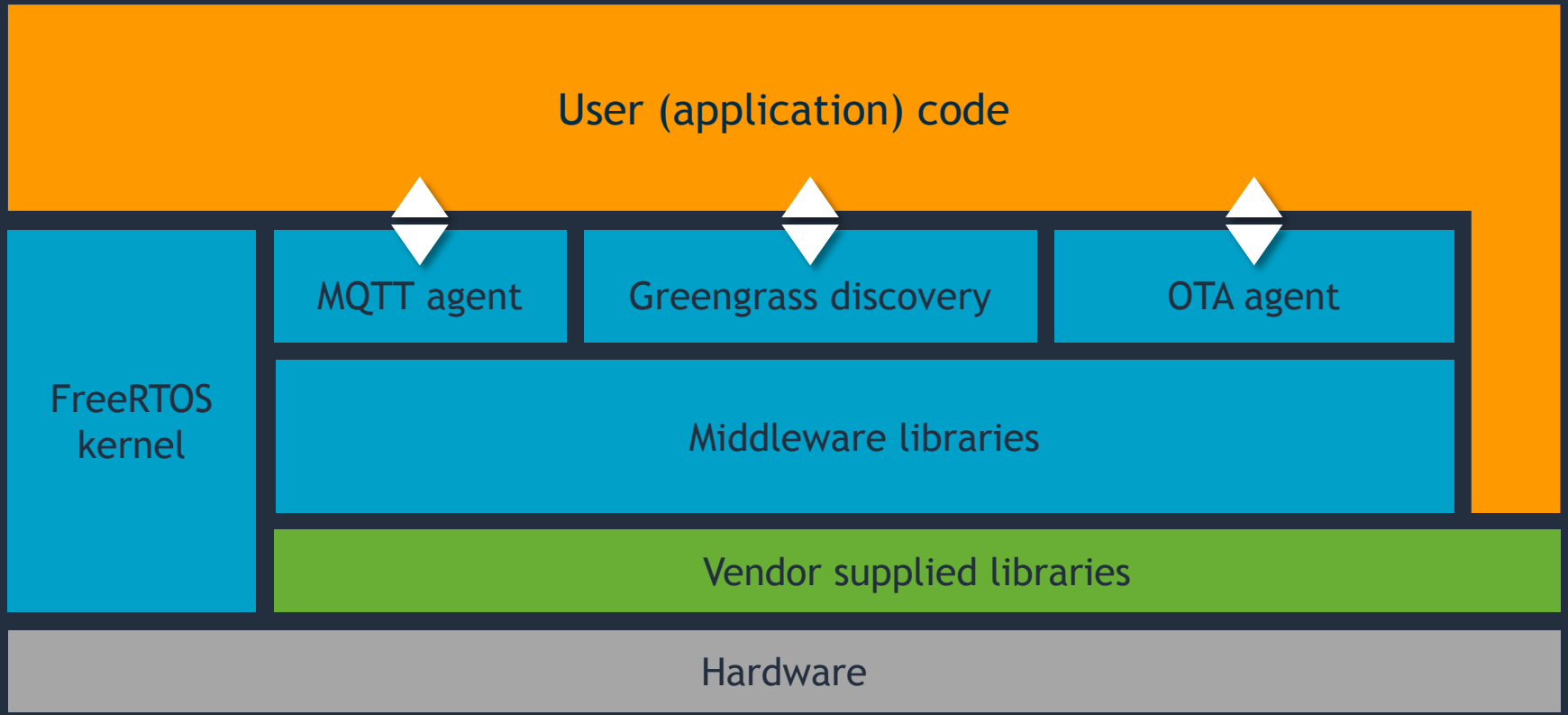
- Meet real time requirements!
- Maximize responsiveness
- Use as little CPU/Power as possible
- Maximize maintainability
- Maximize portability (hardware change)
- Simplicity!
- Fast to market
- Meet requirements with minimum expenditure



Application view with individual libraries



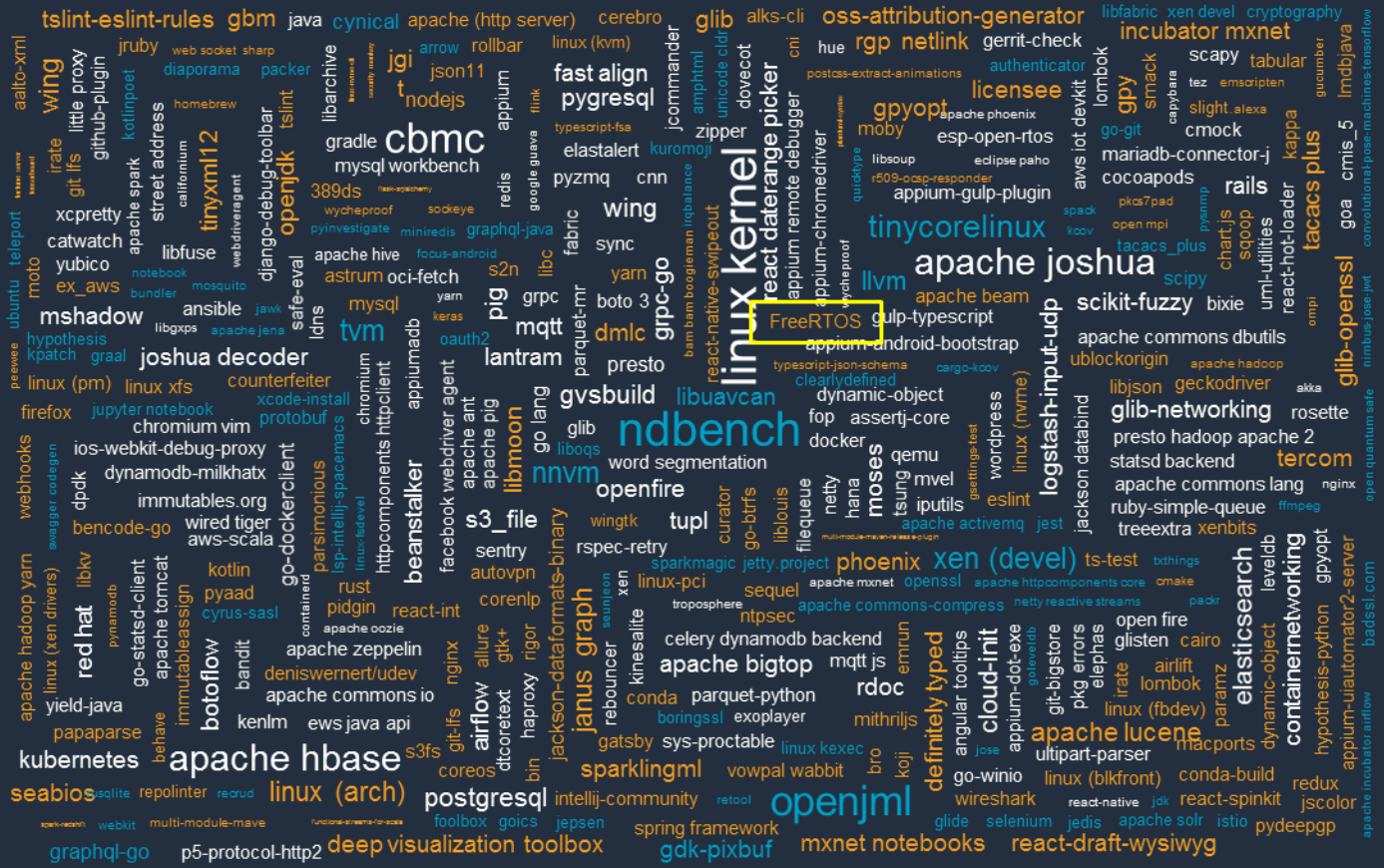
Application view with security and connectivity libraries



2018

2017

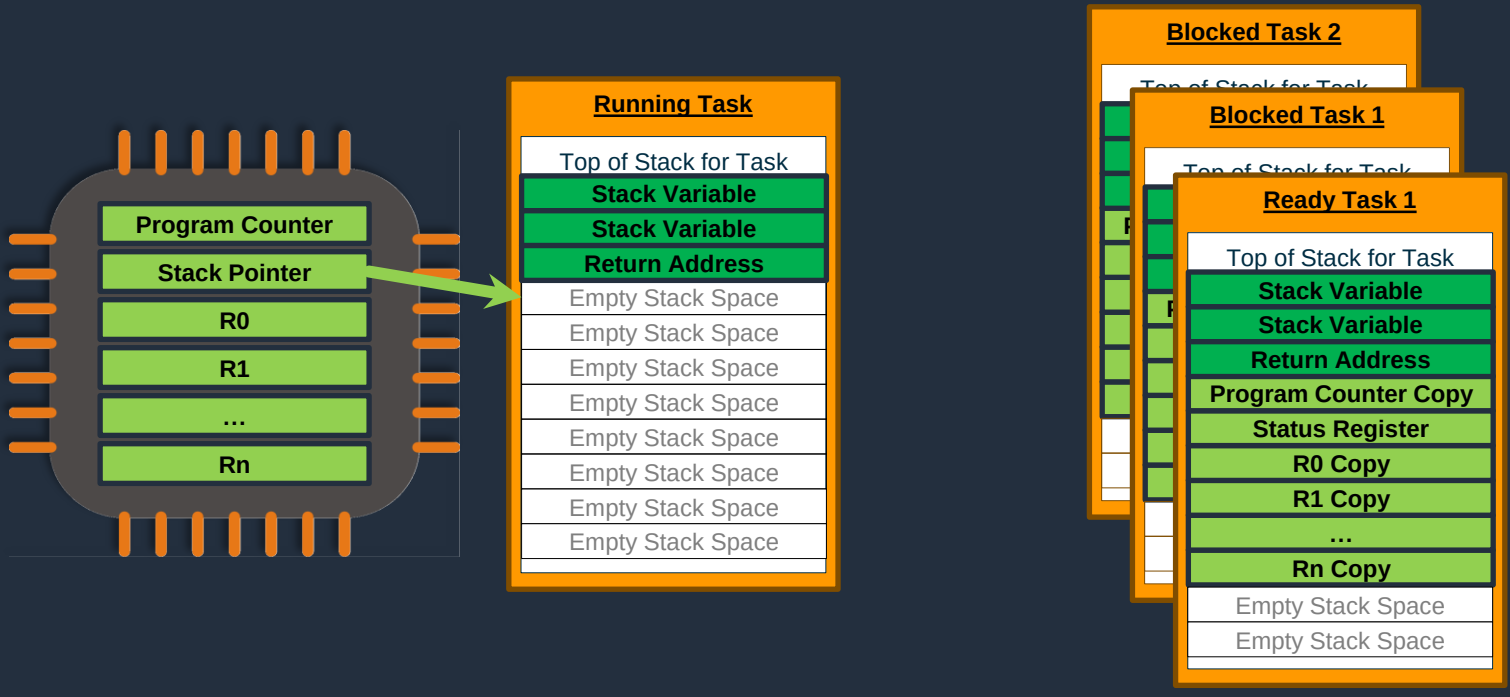
2016



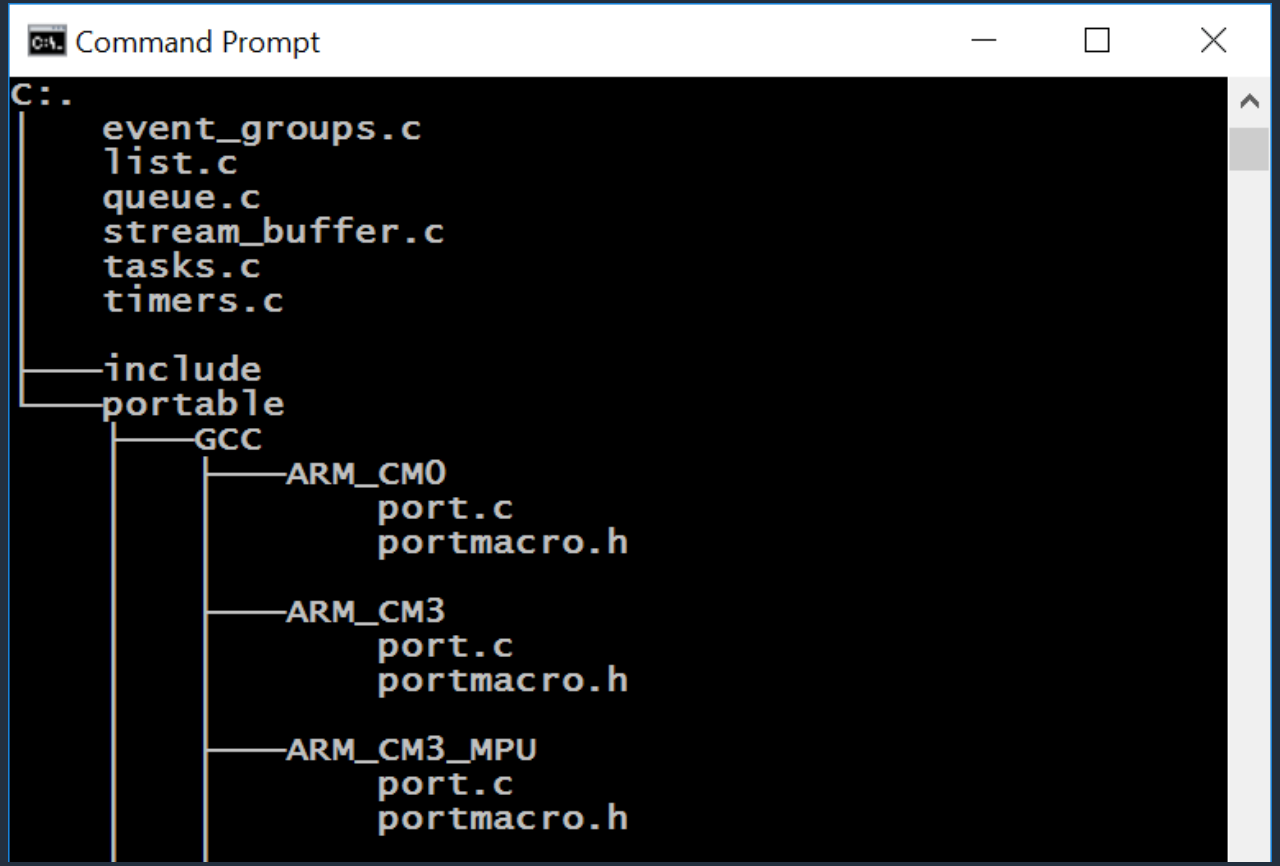
aws

FreeRTOS on RISC-V:
Source Files

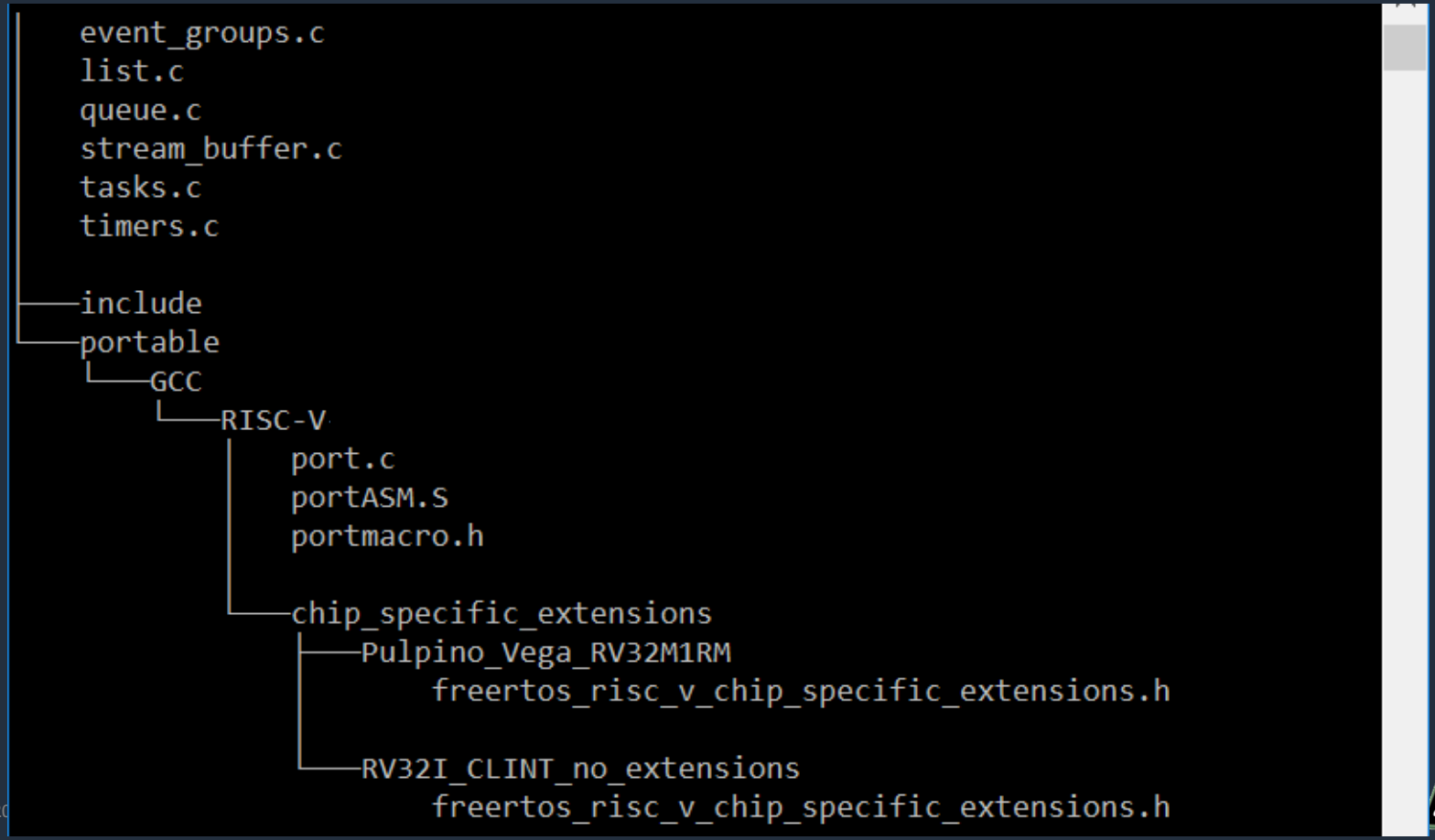
Common source files and port specific source files



Example for Arm

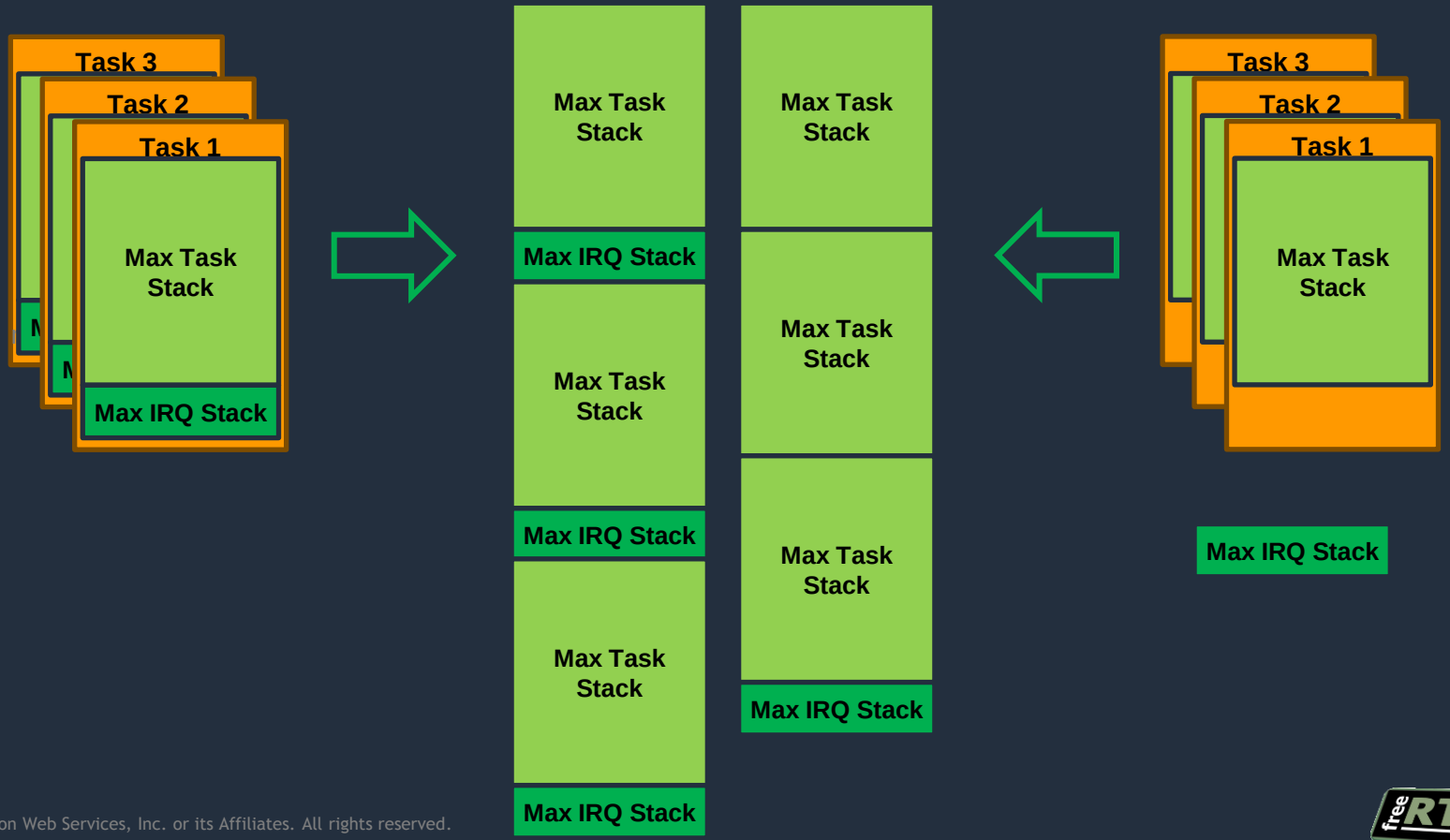


Additional header file for RISC-V



FreeRTOS on RISC-V:
Interrupt stack

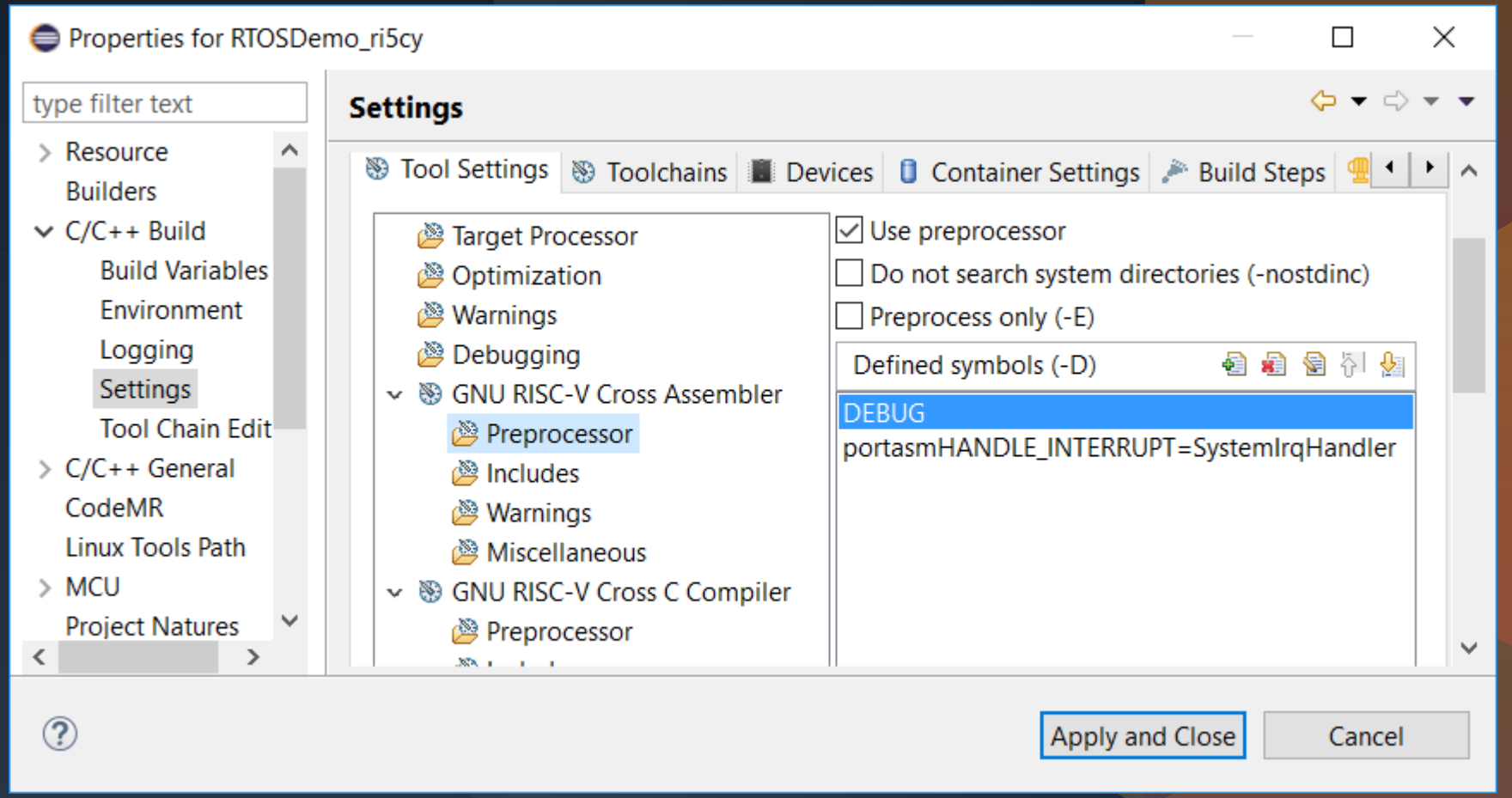
Defining the interrupt stack

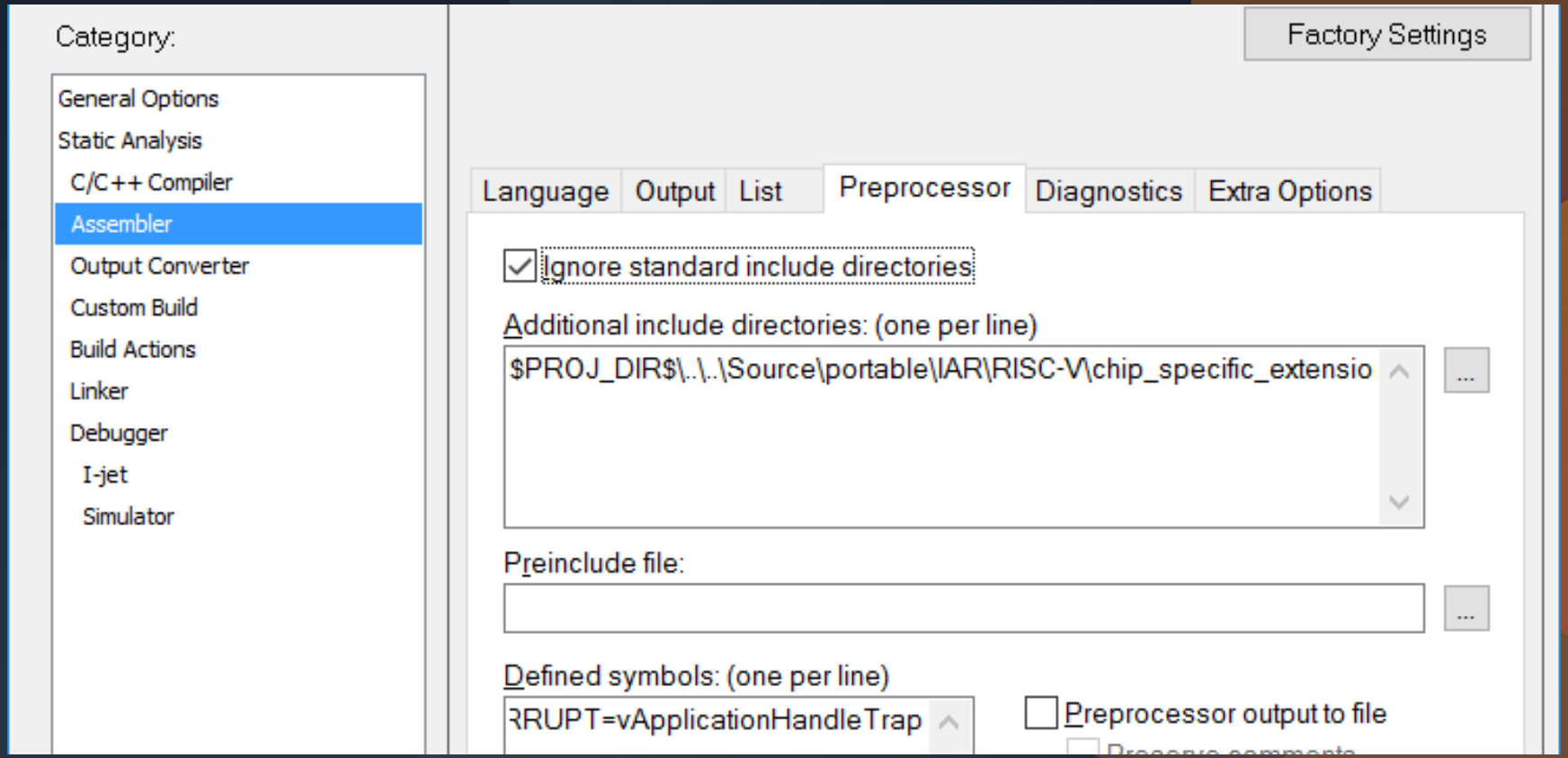


FreeRTOS on RISC-V:
Setting CLINT base address

FreeRTOS on RISC-V:
Installing the FreeRTOS trap handler

FreeRTOS on RISC-V:
Calling an external interrupt handler





Thank You!

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https://www.freertos.org

https://github.com/aws/amazon-freertos

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