

## PRiME Showcase Demonstrator 2018 – Theme 4

### INTRODUCTION

**PRiME partners** are working on **diverse and interlinked topics** that often need different **algorithms** and **applications**.

**Goal:** The **PRiME showcase demonstrator** will bring together contributions from all themes into a single demonstrator:

- Showing how they work together;
- Demonstrating the vision of PRiME.

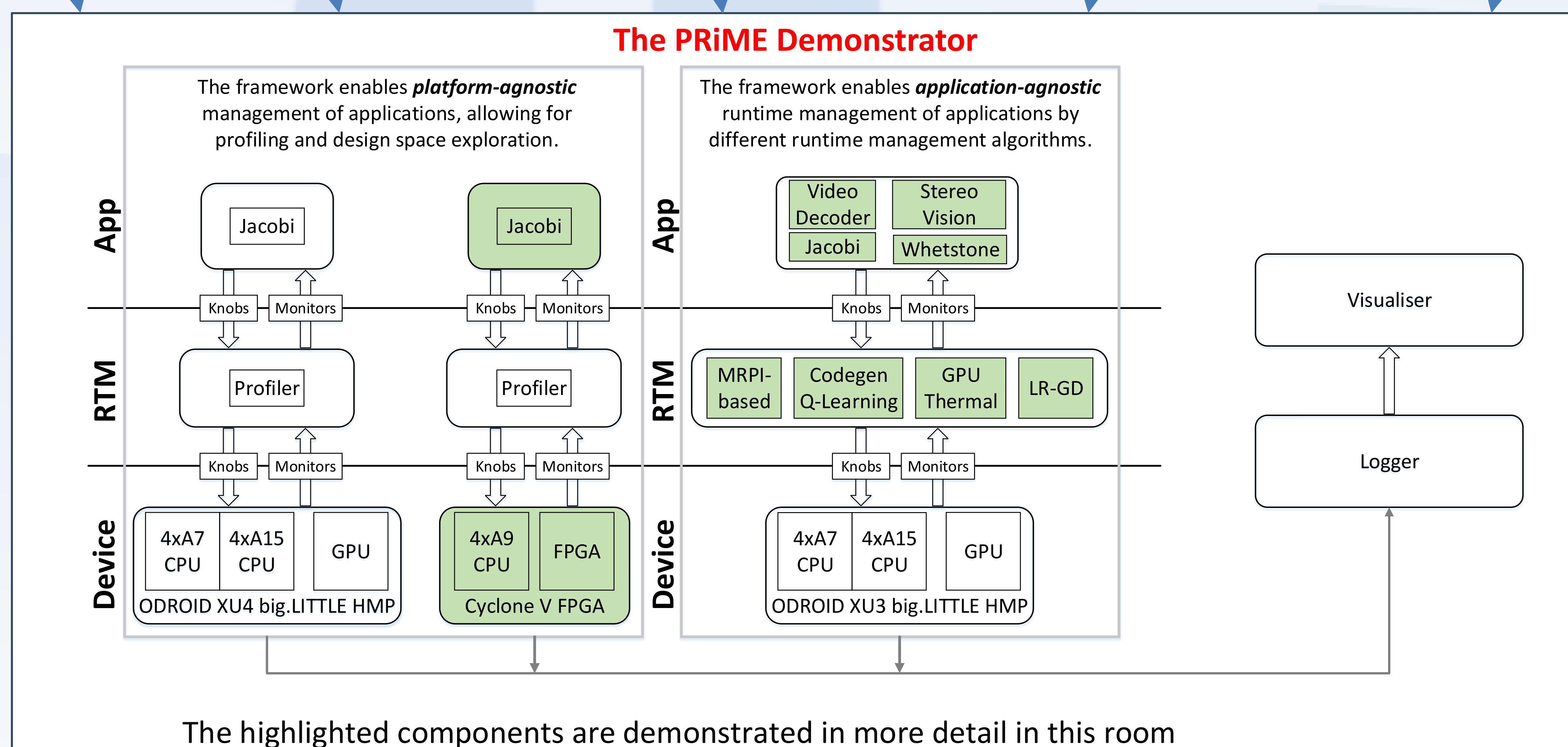
Not every PRiME output/contribution is (*necessarily*) incorporated in the PRiME showcase demonstrator.

### SHOWCASE DEMONSTRATOR

The showcase demonstrator illustrates how the **PRiME Framework** is a fundamental instrument in linking the different PRiME contributions by:

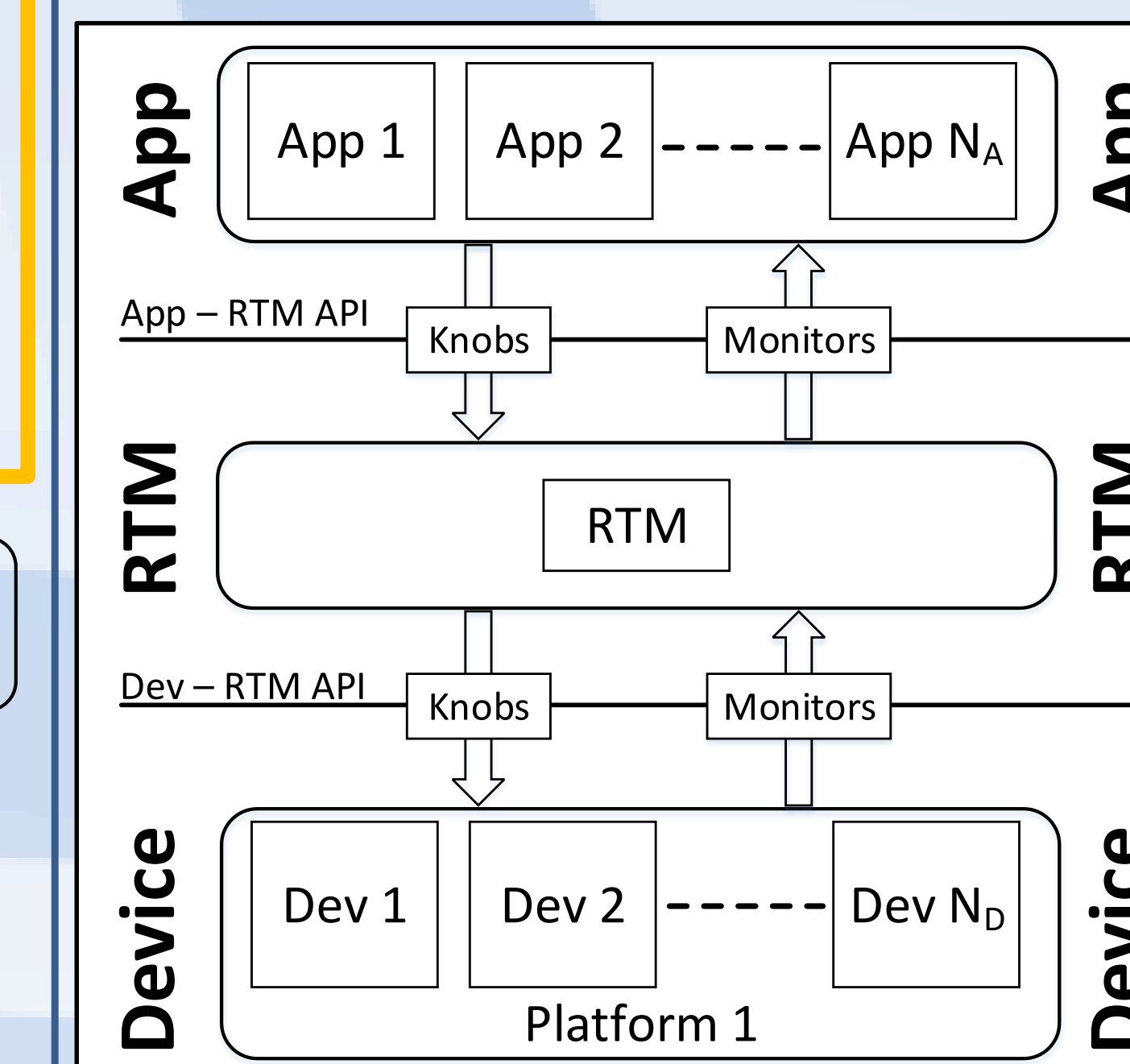
- Using **different Run-Time Management Algorithms**,
- To run **different Applications**,
- On **different Platforms**,
- Incorporating aspects of **Modelling** and **Verification**

Platforms    Profiling    Runtime Algorithms    Formal Verification    Applications



### The PRiME Framework

The PRiME Framework considers a system as three separate layers (**Application, Runtime Management and Device**) that are linked with a defined API that abstracts communication through the exposure of *knobs* and *monitors*.



#### Knobs & Monitors:

- **Knobs:** expose runtime-tunable parameters. A knob is composed of a value, type and initial, minimum & maximum values.  
• e.g. voltage, frequency & iterations.
- **Monitors:** expose observable metrics about the behavior of the device and application. Monitors are either *discrete* or *continuous* and have fields for value, target range (minimum and maximum) and a weighting.  
• e.g. temperature, power & performance.

This allows Runtime Management Algorithms to be *platform* and *application* agnostic.

Each app/platform has different *knobs* and *monitors* exposed through the PRiME Framework:

	Module	Knobs	Monitors
Application	Jacobi	Iterations, Precision, Device	Performance (throughput), Accuracy
	Video Decoder	-	Performance (FPS)
	Whetstone	Threads	Performance (KIPS)
	Stereo Vision	-	Performance (FPS)
Device	Odroid XU3	CPU Frequency, GPU Frequency, Governor selection	CPU & GPU Power, CPU & GPU Temperature, ARM PMCs
	Odroid XU4	CPU Frequency, GPU Frequency, Governor selection	CPU & GPU Temperature, ARM PMCs,
	Cyclone V	CPU Voltage, FPGA Voltage	SoC Power, CPU Power, FPGA Power