FUSION FOR ENERGY

MARTe2 Users Meeting

CRIO, RPI, STM32 demo

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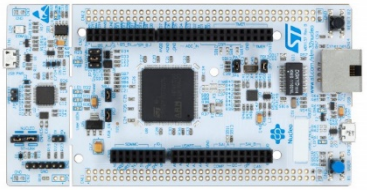
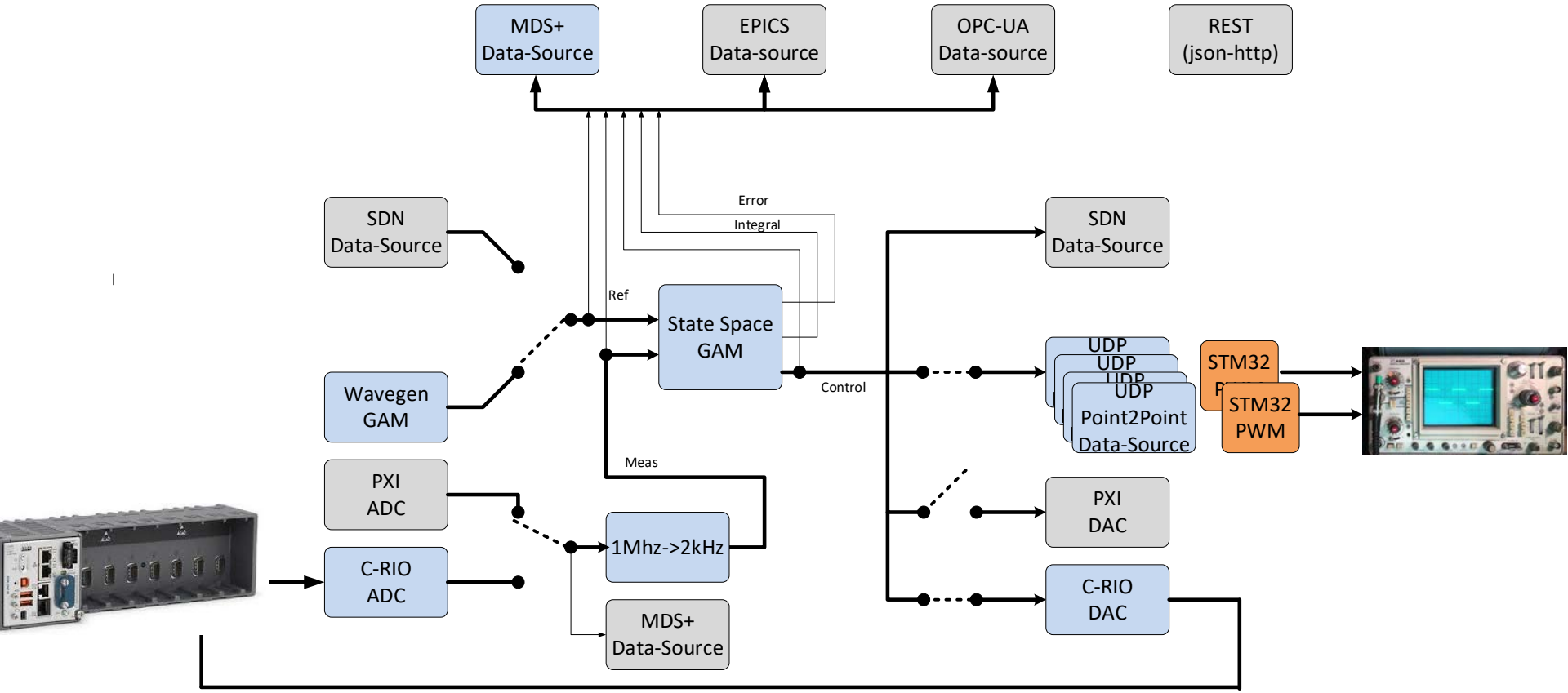
Objective

- Demonstrate real-time interfaces between MARTe2, CRIO and **BareMetal**
  - Using SDN
  - STM32F746G-DISCO
  - STM32F746ZGT-NUCLEO
- Configuration file:
  - https://vcis-gitlab.f4e.europa.eu/aneto/MARTe2-demos-padova/blob/develop/Configurations/RTApp-9157-1.cfg



CRIO – STM – RPI interface



- Configuration file:
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Workflow - CRIO

- **LabView**
  - Implement FPGA design
  - Export variables using the LabView C-API generator tool
  - Expose these variables in the MARTe2 configuration file
    - **No need to recompile**

```
+NiDevice = {
  Class = NI9157Device
  NiRioDeviceName = RIO0
  NiRioGenFile = "NiFpga_Test.lvbitx"
  NiRioGenSignature = "5580A3D7E3CD37531FCD6557CFCD3824"
  Open = 1
  Configuration = {
    NiFpga_TestGTD0001_ControlU8_options = 2
    NiFpga_TestGTD0001_ControlBool_stop = 0
    NiFpga_TestGTD0001_ControlBool_use_counter = 1
    NiFpga_TestGTD0001_ControlU16_maxV = 5
    NiFpga_TestGTD0001_ControlU16_DacResolution = 16383
  }
```

CRIO interfaces

- **MXI**
  - Asynchronous read/write
    - MARTe2 interface for configuration
    - MARTe2 DataSource monitoring/update
  - FIFO streaming
    - MARTe2 real-time I/O DataSource

Workflow – STM32

- **STM32CubeMX**
  - Configure hardware
  - Generate and compile BSP
  - Cross-compile MARTe2
  - Link MARTe2 & BSP
  - Configuration file
    - Compiled as string or
    - Loaded from serial interface
  - Generate and load firmware

https://www.st.com/en/development-tools/stm32cubemx.html

Workflow – RPI3 BM

- **Circle bare metal library**
  - Cross-compile MARTe2
  - Link MARTe2 & Circle
  - Generate and load firmware
    - Configuration file compiled as string

https://github.com/rsta2/circle

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