OPCUA PERFORMANCE MONITORING FRAMEWORK

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Outline

☑ OVERVIEW AND GOALS

☑ HARDWARE USED IN DEVELOPMENT

☑ FRAMEWORK SEQUENCES

☑ COMMAND SEQUENCES

☑ EARLY RESULTS

Overview & Framework's Goals 🚀

- ☑ Measure execution time for reads, writes, transactions, and configurations both inside the server and via client requests.

- ☑ Supports both serial and parallel batch execution (with customizable thread count) for performance comparisons.

- ☑ Compatible with UASK and Open62541 backends.

- ☑ Implements a user-friendly frontend GUI for monitoring selection and results analysis.

- ☑ Provides a framework for monitoring FEB and Latournett cards.

Hardware used
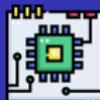
CASA
↳ LpGBT × 1
↳ I2CMaster × 1
↳ I2CSlaveLADOC × 1

CABANE
↳ LpGBT × 2
↳ I2CMaster × 3
↳ I2CSlaveLADOC × 6
↳ DigitalIO × 8
↳ AnalogInput × 8

Framework sequences
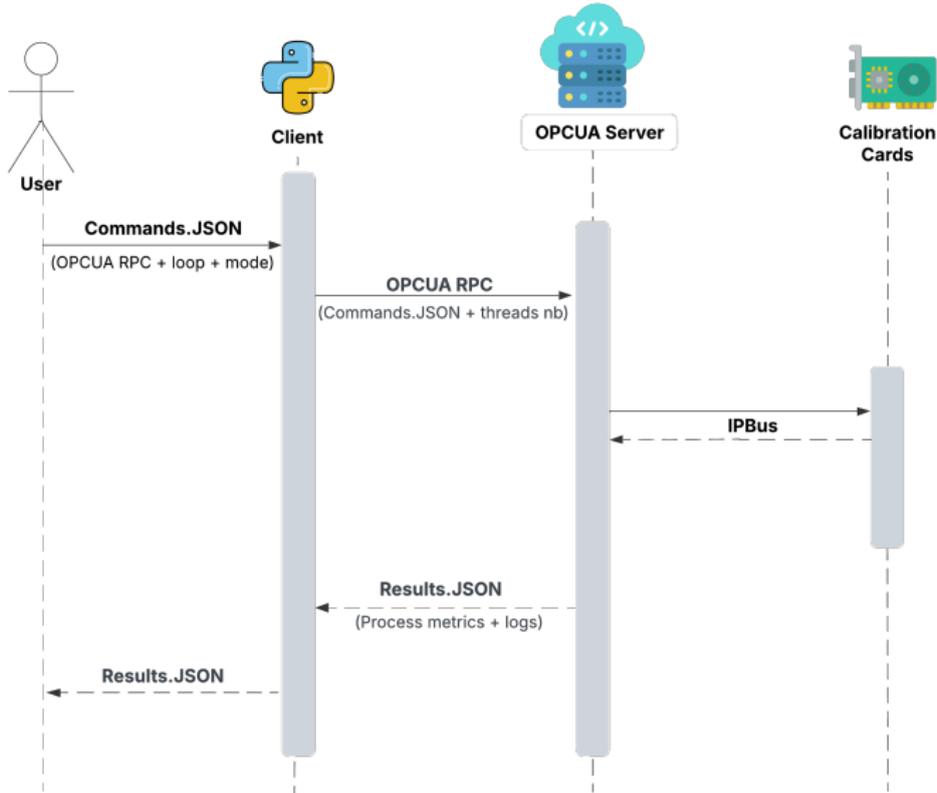
Command Sequences

→ Commands.JSON

```json
{
  "serial": [
    "2:LpGBT:lapp_cabane.LpGBT_A.configure()",
    "4:LpGBT:lapp_cabane.LpGBT_A.registerRead(0x00A8)",
    "6:I2CMaster:lapp_cabane.LpGBT_A.I2CM0.reset()",
    "8:I2CMaster:lapp_cabane.LpGBT_A.I2CM0.configure(nbWords=1)",
    "10:DigitalIO:lapp_cabane.LpGBT_A.GPIO.gpio1.configure()",
    "12:DigitalIO:lapp_cabane.LpGBT_A.GPIO.gpio1.write(1)",
    "14:DigitalIO:lapp_cabane.LpGBT_A.GPIO.gpio1.read()",
    "16:AnalogInput:lapp_cabane.LpGBT_A.AnalogIOSystem.TEMP_T3.read()"
  ],
  "parallel": [
    "2:LpGBT:lapp_cabane.LpGBT_B.configure()",
    "4:LpGBT:lapp_cabane.LpGBT_B.registerRead(0x00A8)",
    "6:I2CMaster:lapp_cabane.LpGBT_B.I2CM0.reset()",
    "8:I2CMaster:lapp_cabane.LpGBT_B.I2CM0.configure(nbWords=1)",
    "10:DigitalIO:lapp_cabane.LpGBT_B.GPIO.gpio1.configure()",
    "12:DigitalIO:lapp_cabane.LpGBT_B.GPIO.gpio1.write(1)",
    "14:DigitalIO:lapp_cabane.LpGBT_B.GPIO.gpio1.read()",
    "16:AnalogInput:lapp_cabane.LpGBT_B.AnalogIOSystem.TEMP_T3.read()"
  ]
}
```

With: " Loop numbers **:** Device Class **:** UA NodeId + method "

Command Sequences

➜ FrontEnd User Interface
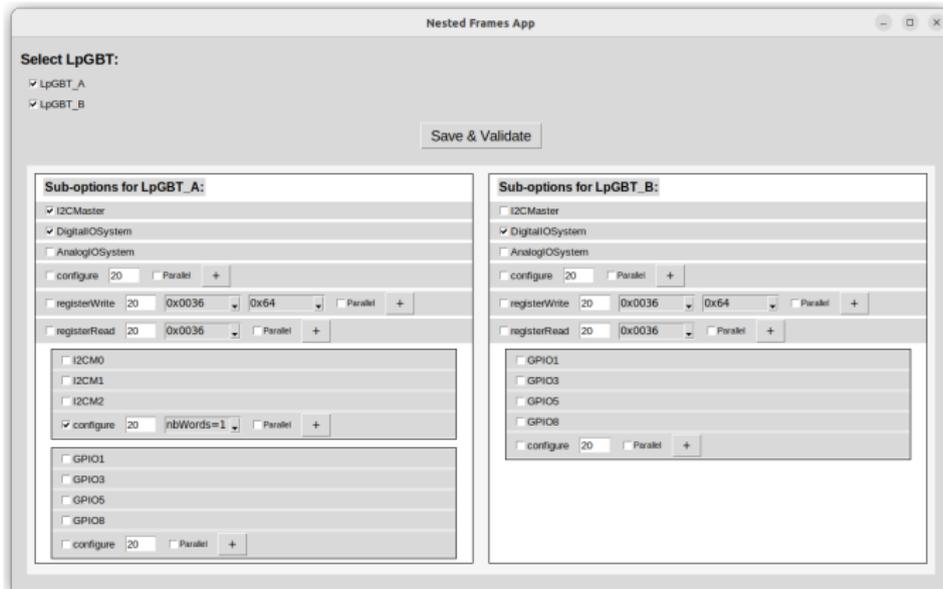
Figure: GUI command sequence builder (Work in Progress)

Early Results

- ◇ **HARDWARE:** CABANE

- ◇ **Command numbers:**
  - ▶ **Serial:** 234 (LpGBT_A + LpGBT_B)
  - ▶ **Parallel:** 234 (LpGBT_A + LpGBT_B)

- ◇ **Command success:** 234/234

Test	Backend	Threads NB (parallel)	Compute Time (s)		Monitored Sums (s)	
			Serial	**Parallel**	**Serial**	**Parallel**
1	open62541	1	1.42	1.74	1.30	1.58
	uasdk	1	2.24	2.13	1.69	1.50
2	open62541	4	1.75	1.39	1.60	5.30
	uasdk	4	1.97	1.56	1.44	5.46
3	open62541	24	1.64	2.02	1.50	45.95
	uasdk	24	1.77	1.35	1.32	29.43