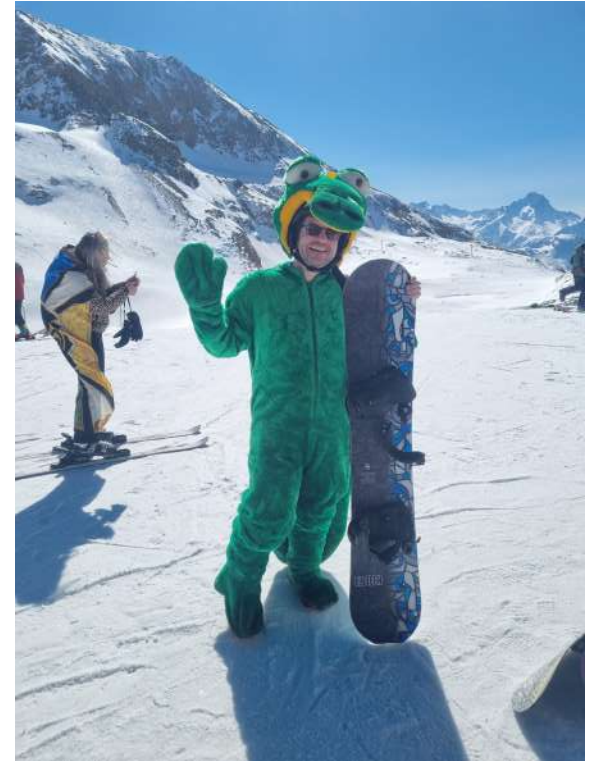


Apache PLC4X: State of the civet



Who am I?

- Christofer Dutz
- Snr. Staff Software Engineer
- Rivian
- Committer of many Apache projects
- Member of the Apache Foundation
- VP of Apache PLC4X
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Agenda

- Focus
- New Protocols
- Supported Languages
- Integrations
- Utils
- Behind the scenes
- Outlook

Focus

- Initially:
 - Connecting to PLCs
 - Reading
 - Writing
 - Subscribing
- Currently:
 - Auto Discovery & Browsing
 - Streamlining the API
 - Extend API with tools for integration in other products

New Protocols

- BacNET
- C-BUS
- ADS (Rewrite)
- PROFINET

Supported Languages

- Plc4J
- Plc4C
- **Plc4Go**
- **Plc4Net (C#)**
- **Plc4Py (Python)**
- **Plc4Rust**

Integrations

- Major update in the Apache NiFi integration

Utils

- OPC-UA Server
- Java GUI
- Golang Text GUI
- PCAP-to-Testsuite

Java GUI

The screenshot displays the PLC4X UI Java GUI. On the left, a sidebar lists available drivers under two categories: 'Available Drivers' and 'Beckhoff TwinCat ADS'. The 'BK_IPC' driver is selected and expanded. The main window shows a table of data points for the BK_IPC driver, with columns for Address, Name, Type, Readable, Writable, and Subscribable.

| Address | Name | Type | Readable | Writable | Subscribable |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|----------|--------------|
| MAIN.hurz_L_WORD | MAIN.hurz_L_WORD | LWORD | true | true | true |
| MAIN.hurz_REAL | MAIN.hurz_REAL | REAL | true | true | true |
| MAIN.hurz_SINT | MAIN.hurz_SINT | SINT | true | true | true |
| MAIN.hurz_STRING | hurz_LDATE_AND_TIME;LDATE_AND_TIME; hurz_LDT.LDT; The following two seem not supported hurz_CHAR.CHAR; hurz_WCHAR.WCHAR; | STRING | true | true | true |
| ▼ MAIN.hurz_Struct | MAIN.hurz_Struct | Struct | true | true | true |
| ▼ MAIN.hurz_Struct.anotherProperty | anotherProperty | Struct | true | true | true |
| MAIN.hurz_Struct.anotherProperty.anotherNumeri... | anotherNumericValue | INT | true | true | true |
| ▼ MAIN.hurz_Struct.anotherProperty.yetAnotherProp... | yetAnotherProperty | Struct | true | true | true |
| MAIN.hurz_Struct.anotherProperty.yetAnotherPr... | yetAnotherNumericValue | INT | true | true | true |
| MAIN.hurz_Struct.someNumericValue | someNumericValue | INT | true | true | true |
| MAIN.hurz_TIME | MAIN.hurz_TIME | TIME | true | true | true |
| MAIN.hurz_TIME_OF_DAY | hurz_LDATE.LDATE; | TIME_OF_... | true | true | true |
| MAIN.hurz_TOD | MAIN.hurz_TOD | TIME_OF_... | true | true | true |
| MAIN.hurz_UDINT | MAIN.hurz_UDINT | UDINT | true | true | true |
| MAIN.hurz_UINT | MAIN.hurz_UINT | UINT | true | true | true |
| MAIN.hurz_ULINT | MAIN.hurz_ULINT | ULINT | true | true | true |
| MAIN.hurz_USINT | MAIN.hurz_USINT | USINT | true | true | true |
| MAIN.hurz_WORD | MAIN.hurz_WORD | WORD | true | true | true |
| MAIN.hurz_WSTRING | MAIN.hurz_WSTRING | WSTRING | true | true | true |
| MAIN.I | MAIN.I | INT | true | true | true |

Golang Text GUI

PLC4X Browser

| Connections | Output | Commands |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>c-bus://192.168.178.101</code> | <p>No 1 @12:02:27.006385</p> <p>No 2 @12:02:32.005081</p> <p>Message nr: 1</p> <pre>PlcSubscriptionEvent Response/responseCodes/subscriptionField: OK types/subscriptionField: SubscriptionEvent intervals/subscriptionField: 0s values/subscriptionField/PlcStruct/SALData/PlcStruct/SALDataLighting/PlcStruct/LightingData/PlcStruct/ commandTypeContainer/PlcStruct/LightingCommandTypeContainer/PlcUSINT: 0x09 9 LightingDataTerminateRamp/PlcStruct/group/PlcUSINT: 0xaf 175</pre> | <p>Last 18 commands</p> <ul style="list-style-type: none">0: discover c-bus1: log set trace2: disconnect c-bus://192.168.178.1013: clear console4: plc4x-conf <p>TraceTransactionManagerWorkers on</p> <ul style="list-style-type: none">5: log set info6: subscribe-direct c-bus://192.168.178.101 mmimonitor/**7: subscribe-direct c-bus://192.168.178.101 salmonitor/**8: connect c-bus://192.168.178.101?Monitor=false&MonitoredApplication1=0x00&MonitoredApplication2=0x009: connect c-bus://192.168.178.101 <p>02:21 connect c-bus://192.168.178.101</p> <p>02:24 subscribe-direct c-bus://192.168.178.101 salmonitor/**</p> |
| <p>Registered drivers</p> <p><code>c-bus</code></p> <p>Clipsal Bus (c-bus) [tcp]</p> <p>s7</p> <p>Siemens S7 (Basic) (s7) [tcp]</p> | <pre>request/PlcSubscriptionRequest Request/fieldNames/subscriptionField: types/subscriptionField: subscriber: SubscriptionEvent {0x400033c080 map[0x400071c700:0xd048f0]} values/subscriptionField/PlcSubscriptionHandle/plcSubscriber: {0x400033c080 map[0x400071c700:0xd048f0]}</pre> | |

<https://github.com/apache/plc4x>

PCAP-to-Testsuite

- Allows converting a PCAP recording into the xml representation our testsuite can understand

Behind the scenes

- Complete rework of the Java code generation
- Introduction of 4 new field types
- Major improvements in parsing & serialising

Outlook

- Increase the percentage of generated code
- Adding Auto-Discovery and Browse functionality to more drivers
- Getting the Divers on-par in all supported languages
- Battle testing more and more of our drivers

Increase the amount of generated code:

- Currently only data types, serializers & parsers get generated
- Next step: Message templates and response handlers
- Step after that: Protocol logic as State-Machine

Want to join in?

- Subscribe to dev@plc4x.apache.org
- Join our Apache Slack channel
- Follow us on Twitter: @ApachePLC4X

Questions?

