

ECLIPSE UNIDE

UNDERSTAND INDUSTRY DEVICES

<https://www.eclipse.org/unide>

Eclipse Unide

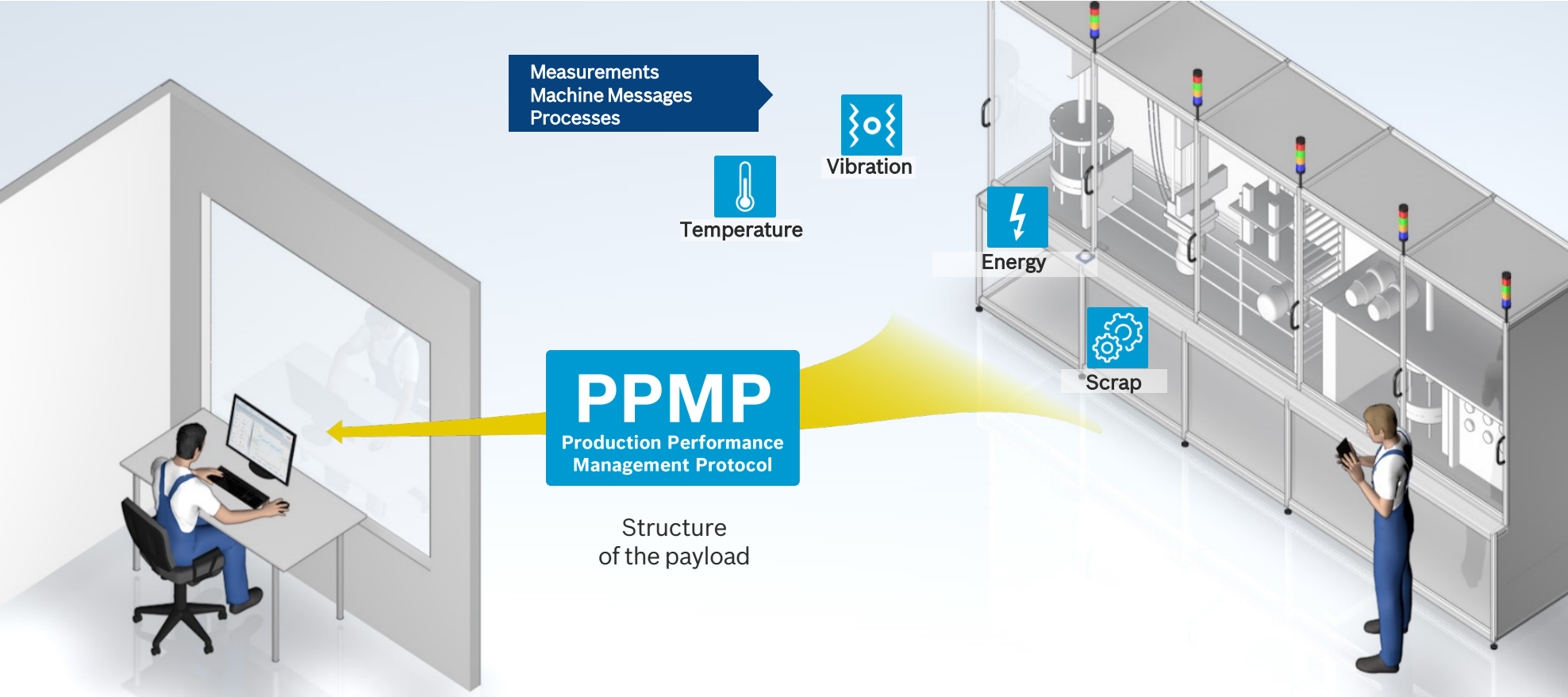
What is Unide?

- ▶ **Understand Industry Devices**
- ▶ Created in August 2016
- ▶ Tools and implementations
 - Validation of PPMP-Messages
 - Visualization and persisting of PPMP-data
 - Bindings for implementations
- ▶ Platform for PPMP specification and further development
- ▶ Target group
 - Small & Medium Enterprises
 - Industry component manufacturer
 - Software developer



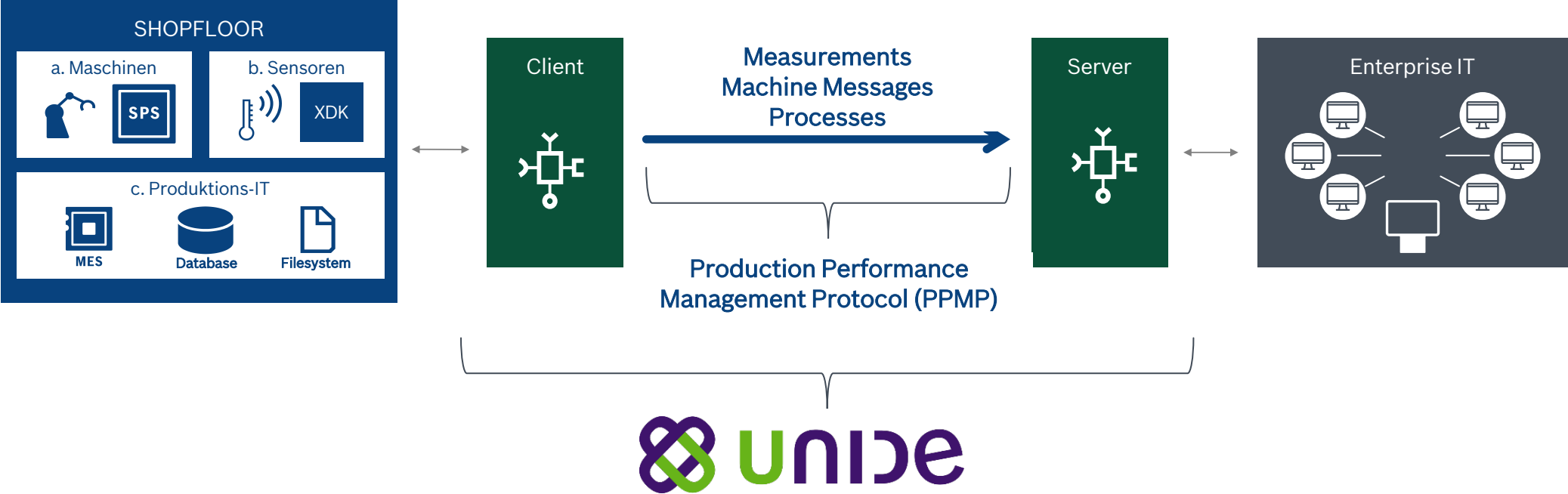
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What is PPMP?



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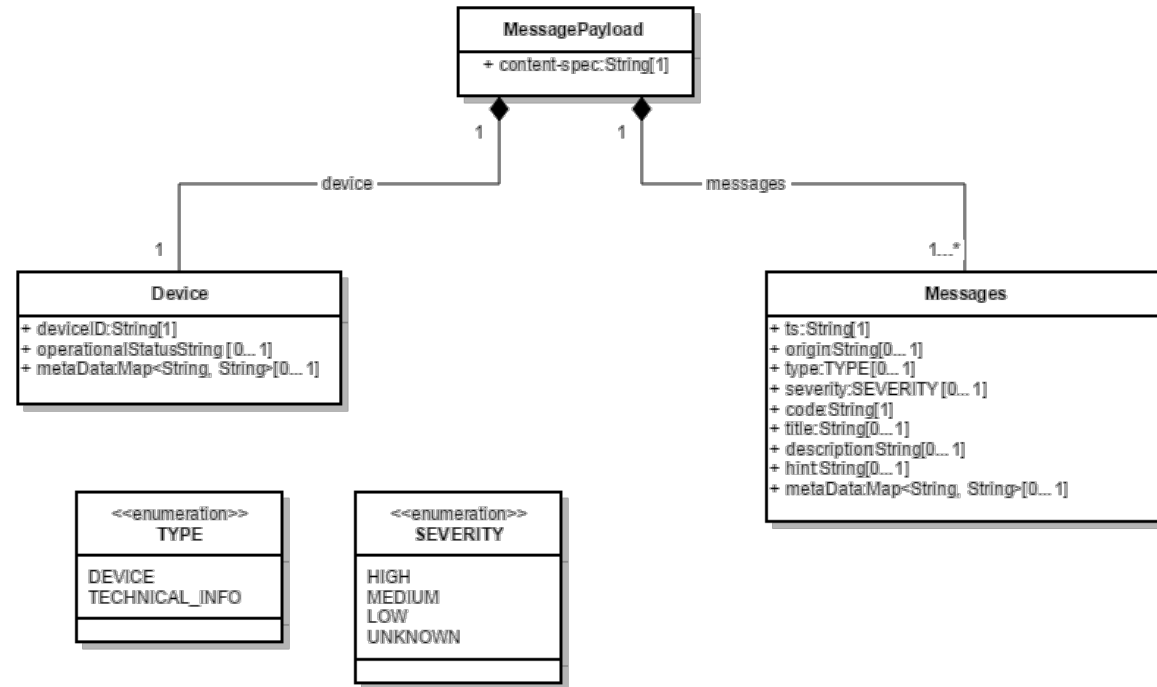
Difference between Unide and PPMP?



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What is PPMP?

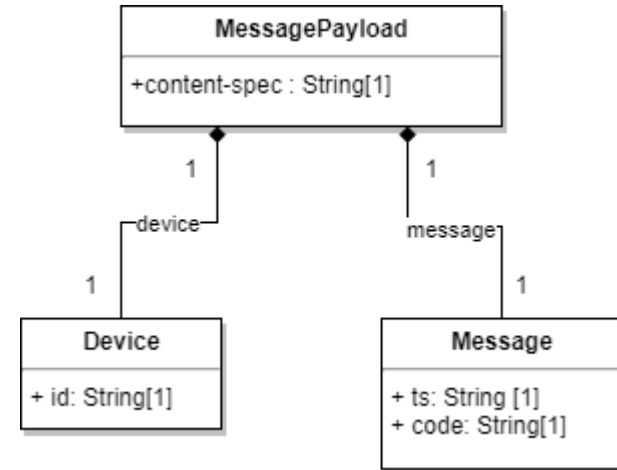
- ▶ Production Performance Management Protocol
- ▶ An Open standard for I4.0
- ▶ Focus on message payload, not transport protocol
- ▶ Three defined message types yet
 - Machine messages
 - Measurement messages
 - Process messages
- ▶ Specification under <https://www.eclipse.org/unide/specification>



Eclipse Unide Tooling - Bindings

- ▶ Binding/serializing functionalities for getting programming language object out of PPMP-JSON-strings
- ▶ Object definition in different programming languages (Java and Python today)

```
{  
  "content-spec": "urn:spec://eclipse.org/unide/machine-message#v2",  
  "device": {  
    "deviceID": "2ca5158b-8350-4592-bff9-755194497d4e"  
  },  
  "messages": [{  
    "ts": "2002-05-30T09:30:10.123+02:00",  
    "code": "190ABT"  
  }]  
}
```



→ <https://github.com/eclipse/unide>

Eclipse Unide Tooling - Validation

- ▶ JSON-schema validation
- ▶ POST-Requests with PPMP-Body
- ▶ Parameter `validate=true`
- ▶ Response with
 - 200 OK
 - 400 Bad Request, Response-Body with validation information
- ▶ Schema identified by content-spec

The screenshot shows the Eclipse Unide REST client interface. At the top, a POST request is configured for the URL `http://unide.eclipse.org/rest/v2/message?validate=true`. The request body is set to raw JSON (application/json) and contains the following JSON:

```
1 {
2   "content-spec": "urn:spec://eclipse.org/unide/machine-message#v2",
3   "device": {
4     "deviceID": "2ca5158b-8350-4592-bff9-755194497d4e"
5   },
6   "messages": [
7     {
8       "ts": "2002-05-30T09:30:10.123+02:00",
9       "code": "190ABT"
10    }
11  ]
12 }
```

The response is a 400 Bad Request with a response time of 167 ms. The response body is shown in JSON format and contains the following validation errors:

```
1 {
2   "device.deviceID": "is missing but it is required",
3   "device.deiceID": "is not defined in the schema and the schema does not allow additional properties"
4 }
```

Eclipse Unide Tooling – Data generation

System

- Status
- Device
- Cloud Services
- Drivers and Assets
- Wires**
- Packages
- Settings

Services

Search +

- Simple Artemis MQTT Broker
- ActiveMQ Artemis Broker
- ClockService

Wire Graph

Apply *
Zoom In
Zoom Out

Delete Component
Delete Graph

```

graph LR
    TIMER2[TIMER2] --> OPCUAASSET[OPCUAASSET]
    OPCUAASSET --> PPMP[PPMP]
    
```

Wire Components

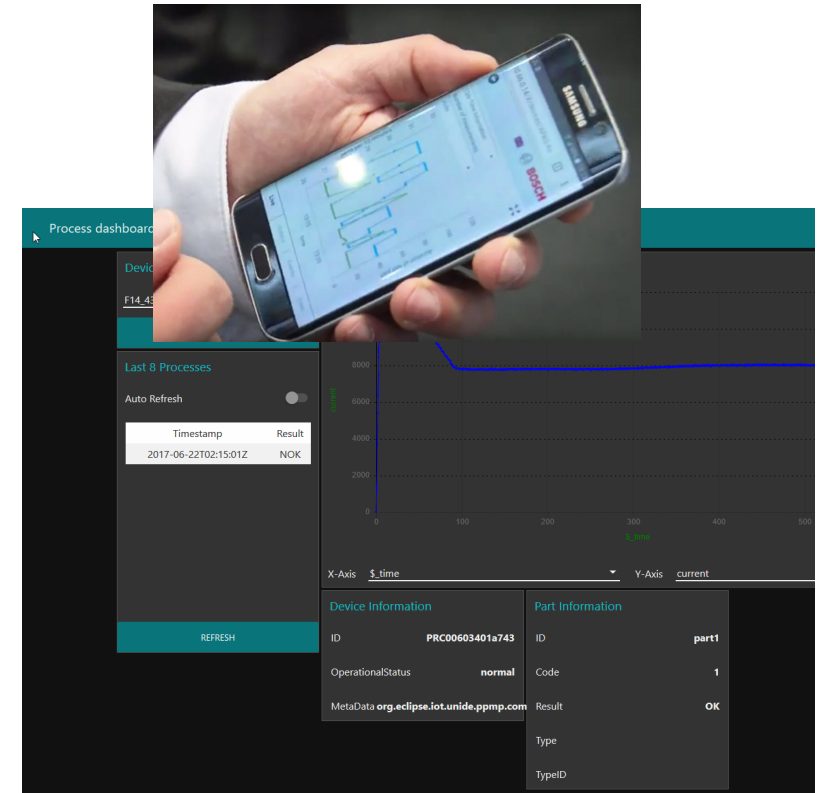
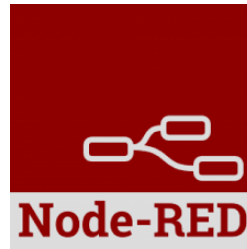
- ← Subscriber
- ← Timer
- Publisher
- Logger
- ⇌ Pmp
- ⇌ ScriptFilter
- ⇌ HSQL DB Filter

New Channel Delete Channel

name	type	value type	node.id	node.namespace.index	node.id.type
TorqTemp	READ	DOUBLE	TorqTemp	5	STRING
VibTemp	READ	DOUBLE	VibTemp	5	STRING
Vibration	READ	DOUBLE	Vibration	5	STRING
Pressure	READ	DOUBLE	Pressure	5	STRING
Torq	READ	DOUBLE	Torq	5	STRING

Eclipse Unide Tooling - Visualization

- ▶ Use of existing, open and easy to use tools
- ▶ Open Source applications:
 - ▶ Grafana
 - ▶ Node-RED
- ▶ Commercial applications
 - ▶ Contact Elements for IoT
 - ▶ Bosch PPM



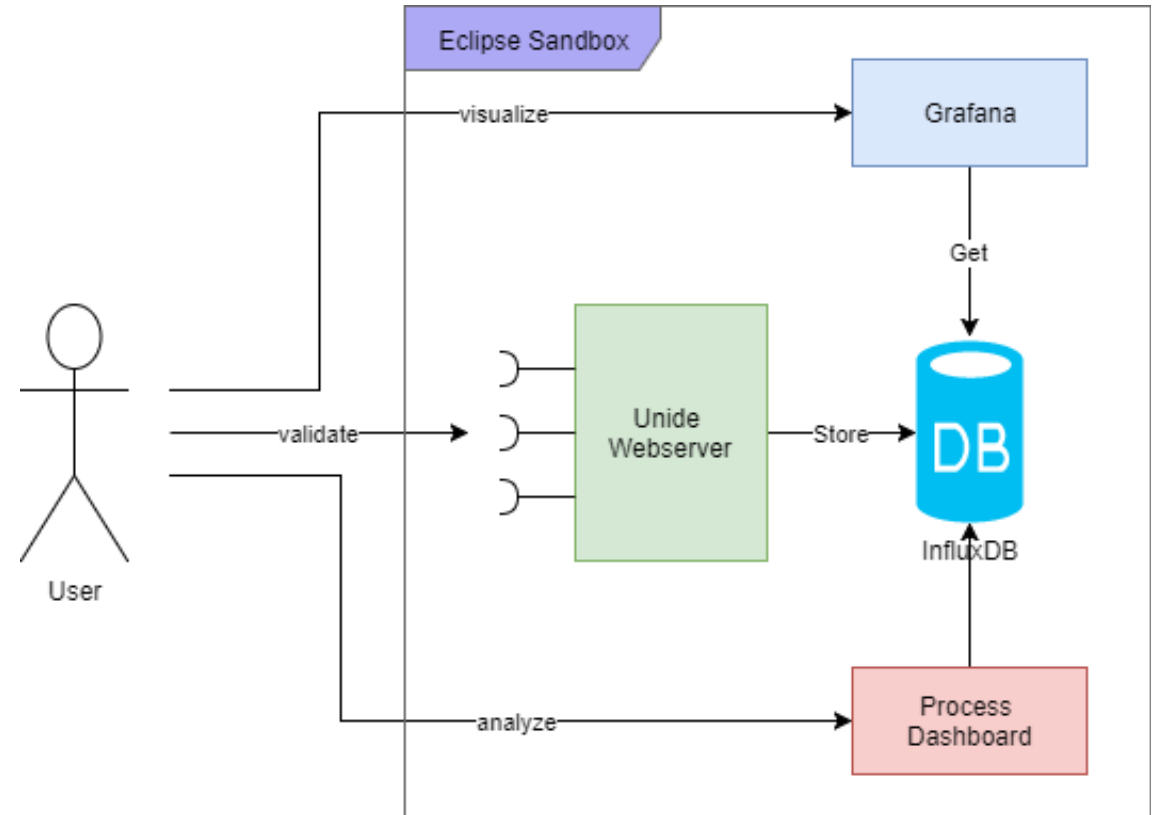
Eclipse Unide Test environment

- ▶ Sandbox hosted @ Eclipse
- ▶ HTTP-Webserver for validating and storing in database
- ▶ Grafana Server for visualizing messages and measurements
- ▶ Node-Red dashboard for analyzing process data

→ Validation

→ [Grafana](#)

→ [Process dashboard](#)



Eclipse Unide

Project stats? Let's look at the Ecosystem



Eclipse Unide

Collaboration with other Eclipse IoT Projects

- ▶ Integration with **Kura** / Kura Wires
- ▶ PPMP Function block in Eclipse **4diac**
- ▶ **Milo? Vorto? Cyclone?**
- ▶ **hono PoC**

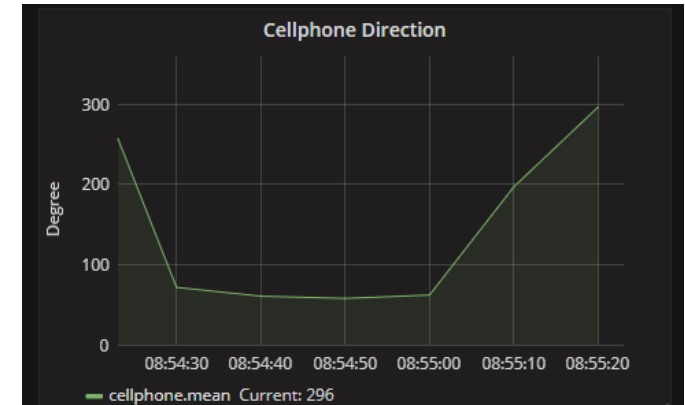
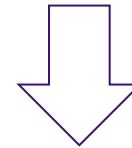
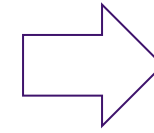
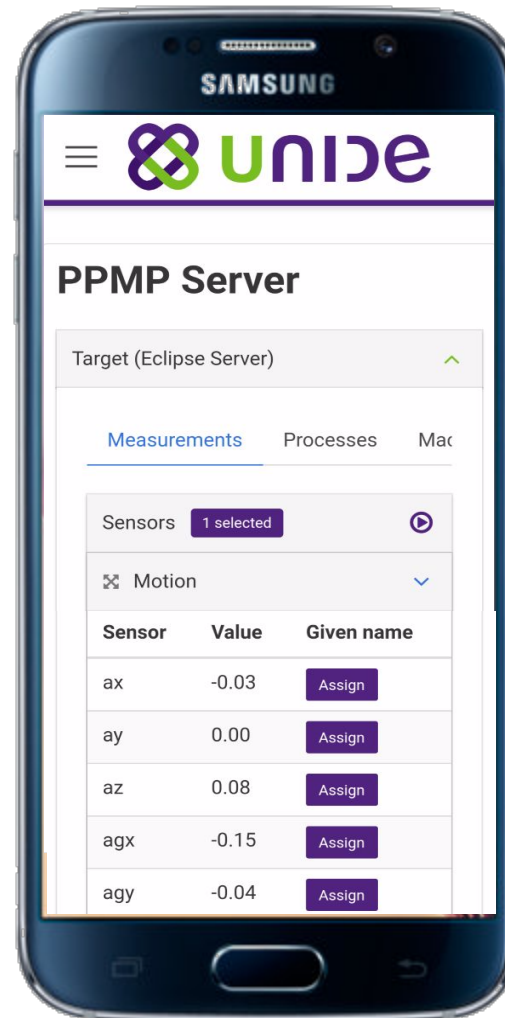
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Next steps

- ▶ **Unide 0.1.0** planned on Nov-1
(<https://projects.eclipse.org/projects/iot.unide/releases/0.1.0>)
 - ▶ Java binding + Validation/Persistence Server over HTTP/REST
- ▶ Start discussions around PPMP v3
- ▶ Features planned
 - ▶ HTML5 Client
 - ▶ Providing REST-interface specification (e.g. Swagger-UI)
 - ▶ Process data storage and visualization
 - ▶ Node.js PPMP-Client
- ▶ Evaluation topics
 - ▶ IoT-to-Machine communication
 - ▶ Further message types (e.g. geolocalization, machine meta information,...)

Eclipse Unide Tooling – Data generation

- ▶ Use any modern cellphone
 - ▶ Use (encrypted) local storage (indexedDB)
 - ▶ Multilanguage
 - ▶ Offline capable (serviceworker)
- ▶ Define multiple server
- ▶ Scan qr code of machine
- ▶ Match sensors & frequencies
- ▶ Play!



THANK YOU

