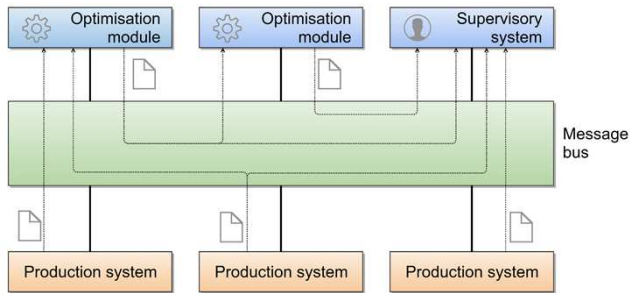


Software Architecture

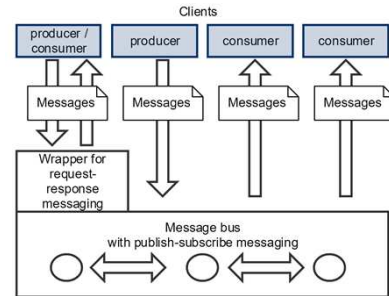
General Architecture

- Promote loose coupling of systems
- Communication based on
 - a message bus
 - commonly agreed message structures



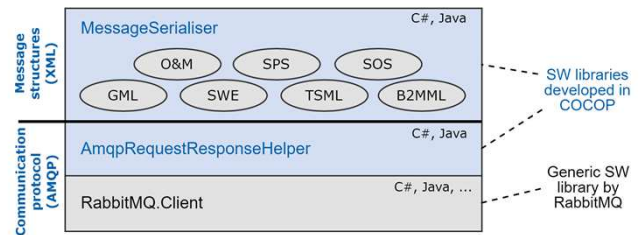
Supported communication patterns:

- publish-subscribe -> scalable for data streaming
- request-response -> enable integration to a variety of existing systems



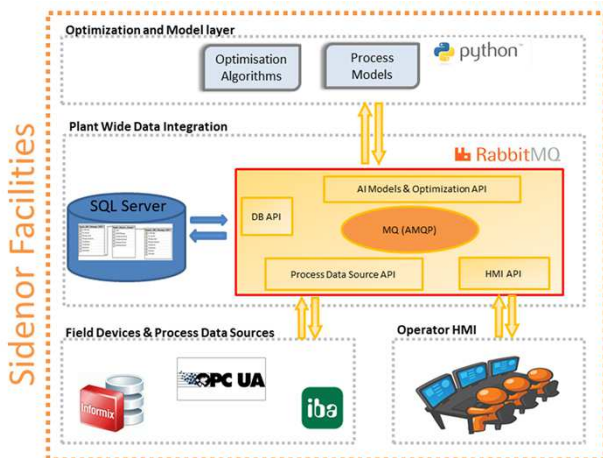
SDK

- Message structures and communication protocol are in separate layers
- The communication protocol is AMQP (v. 0-9-1)
- Messages structures are based on standards
 - O&M, SPS, SOS, GML, SWE, TSML: Open Geospatial Consortium (<http://opengeospatial.org>)
 - B2MML (implements ANSI/ISA-95): MESA International (<http://www.mesa.org/en/B2MML.asp>)
- SDK developed for .NET (C#) and Java
 - Still, messages are platform independent -> mixed platforms can exchange data



	Standard/specification	Purpose
AMQP	Advanced Message Queueing Protocol	Message bus
B2MML	Business to Manufacturing Markup Language	In COCOP: schedules
GML	Geography Markup Language (2016)	Measurement values
O&M	Observations and Measurements (2013)	Metadata of measurements
SOS	Sensor Observation Service (2012)	Request-response delivery of measurements
SPS	Sensor Planning Service (2011)	Remote control of tasks
SWE	SWE Common Data Model Encoding (2011)	Measurement values
TSML	TimeseriesML (2016)	Time series

Implementation: Steel



Implementation: Copper

