

Implementation Aspects of Agent Substitution Mechanism in RedSib

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Summary

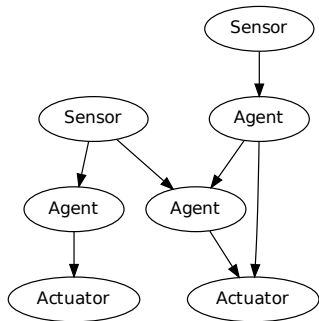
- Dataflow network is a model for distributed computing
- Dataflow network can be implemented on Smart-M3 platform
- End user intelligent services can be conform to dataflow network model
- For such services robustness can be a key factor
- Proposed approach – agent substitution
- Implementation requires modification of SIB



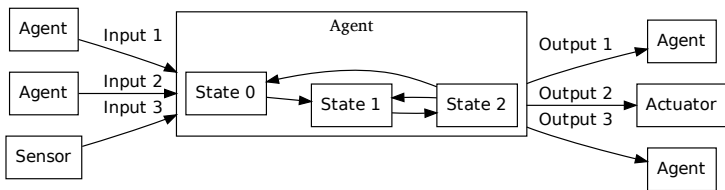
Dataflow Network Structure

Dataflow node types

- Sensor – provide data
- Agent – process data
- Actuator – use results to perform some action



Dataflow Agent Model

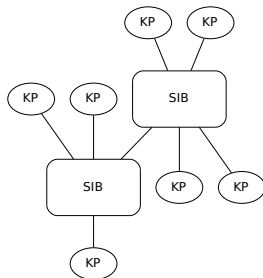


- Dataflow agents are stereotypical
- Agents have has
 - Input channels
 - Output channels
 - Operation program
 - Computation state



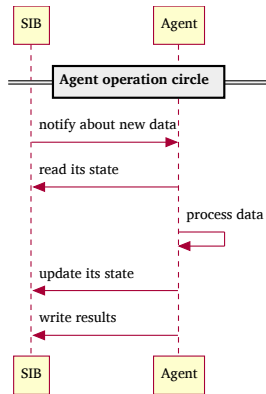
Smart-M3 Platform

- Middleware for multi-agent intelligent services
- Core elements: Semantic Information Broker (SIB) and Knowledge Processor (KP)
- SIB stores data and provides access to it
- KP query and modify data



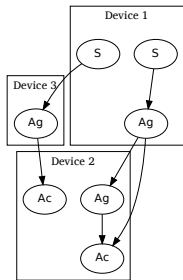
Dataflow Network Implementation on Smart-M3 Platform

- Dataflow nodes are represented as KPs
- Context is stored inside SIB
- Inputs are subscriptions
- Outputs are triple modifications

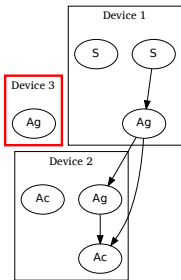


Agent Substitution Mechanism

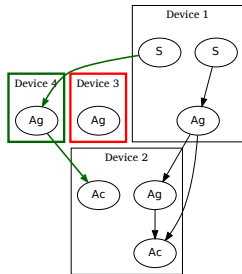
Normal
network
operation



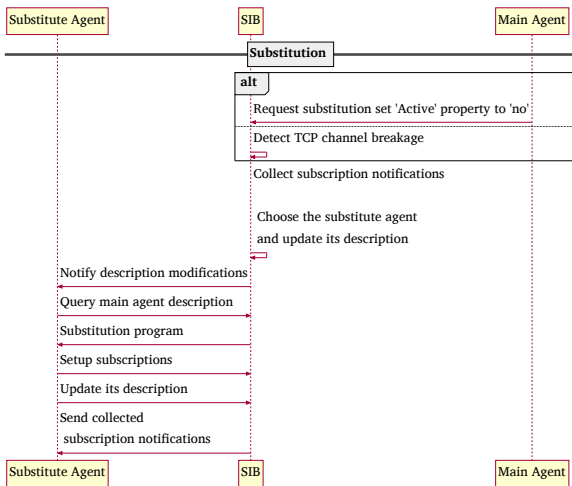
An agent loses
connection



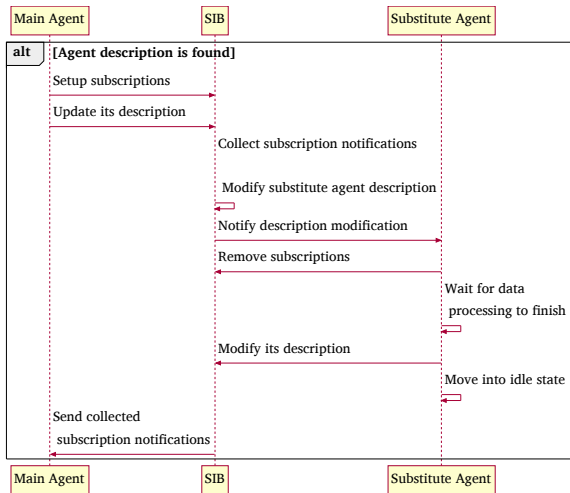
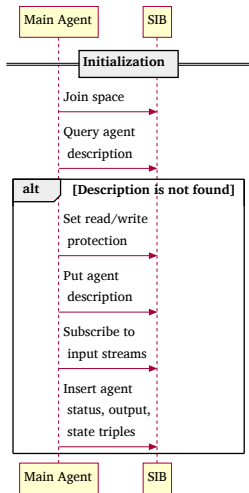
Substitute agent
operation



Substitute Agent Operation



Main Agent Operation



Operation Level of Dataflow Network

- Need to add new operations: agent substitution, registration and disconnection
- Which information exchange level choose?

	Low level	High level
Implies	Modification of SSAP	Usage of triple-based exchange
Benefit	Allows to execute several operations per one transaction	Allows to use platform as ready data exchange middleware



Handler Implementation Alternatives

- Need to monitor agent state
- The state represented in triple format
- How to handle state triples?

**One handler per one
triple template for all
agents**

**Several handlers for
each of agents**

Difference: amount of running handlers



SIB Modules Modification

