



openETCS API Strategy & Review Workshop @ Munich 10.04.2014

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openETCS@ITEA2 Project

Baseliyos Jacob, DB Netz AG

Munich, 10.04.2014

AGENDA API Strategy & Review

@Munich 10.04.2014



- 09:00 – 09:10 Introduction of the partners and experts from ERSA, GE, Alstom, Siemens, DLR, DB and NS -> All partners
- 09:10 – 10:30 Objectives, planning and resources of the API Strategy & Review workshop
- 10:30 – 10:40 Coffee break
- 10:40 – 11:40 Commercial, technical and performance requirements and expectations to the open ETCS API document (D2.6-9, §7.1) from the RU's (SNCF, DB, NS, ATOC and ÖBB) -> Jan Welvaarts NS/Lloyds and Baseliyos Jacob DB
- 12:00 – 12:45 lunch
- 12:45 – 13:45 Report (review) on the API structure from the partners (by slides, oral report or hand-out) -> All partners
- 13:45 – 14:30 WP 3 requirements to the openETCS API (SysML and Git-Hub issues) -> Bernd Hekele DB

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- **14:30 – 14:40 Coffee break**
- **14:40 – 15:00 Further strategy and steps on the openETCS API/Planning of milestones -> Baseliyos Jacob DB and all partners -**
- **15:00 – 15:30 Key-decisions (Who? When? Where? Timeschedule! Resources!) -> Baseliyos Jacob DB and all partners**
- **15:30 – 16:00 Management summary report -> Klaus-Rüdiger Hase DB and all partners (online meeting minutes)**

Objectives

Decide on:

- **Alstom API will be the starting point for the openETCS API**

Planning:

- **Target: SysML API ready 1st of July**

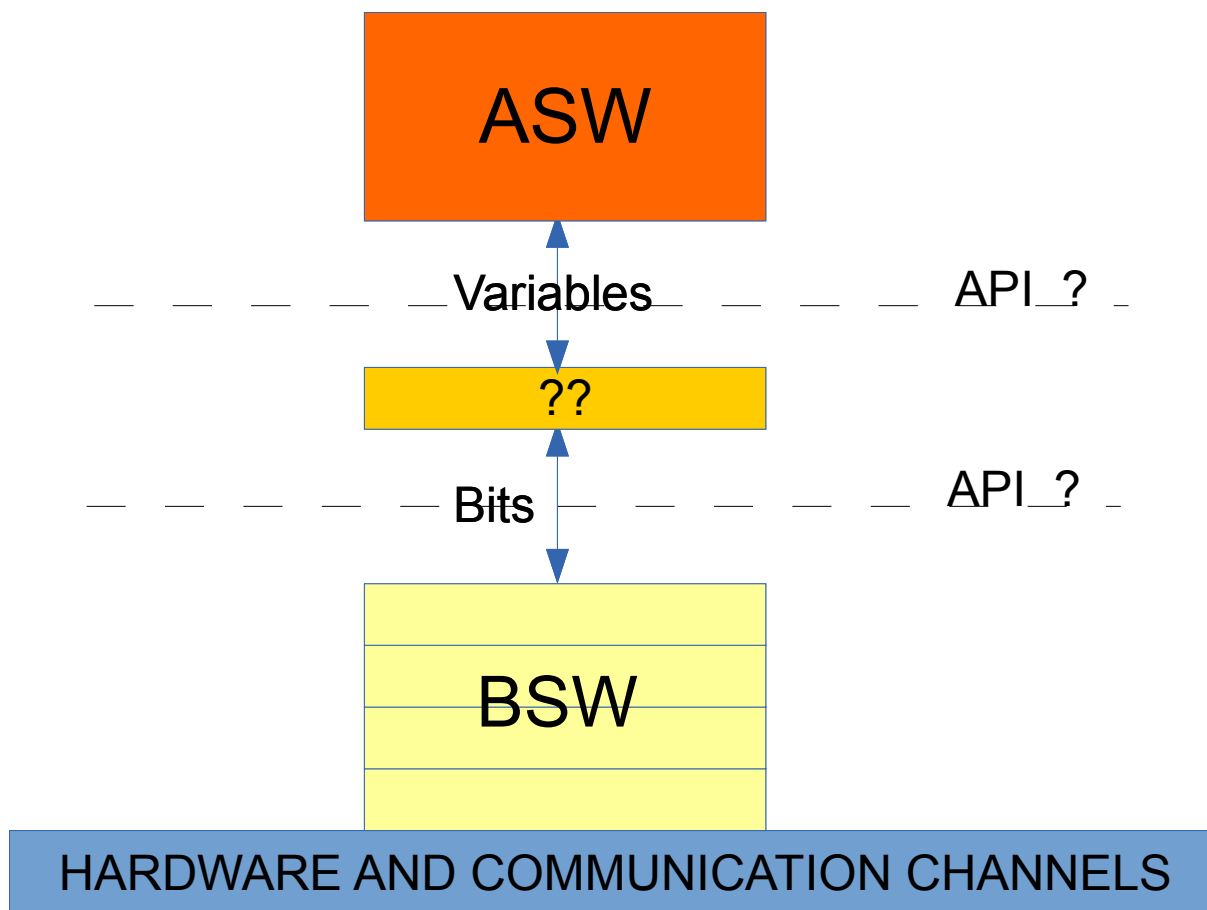
Conditions:

- **WP3 will model the API in SysML**
- **Resources and process (WP 3 leader=product owner)**
- **Special (user) requirements for the API**
- **Agreement on the requirements from the partners**
- **Agreement on the API abstraction level**

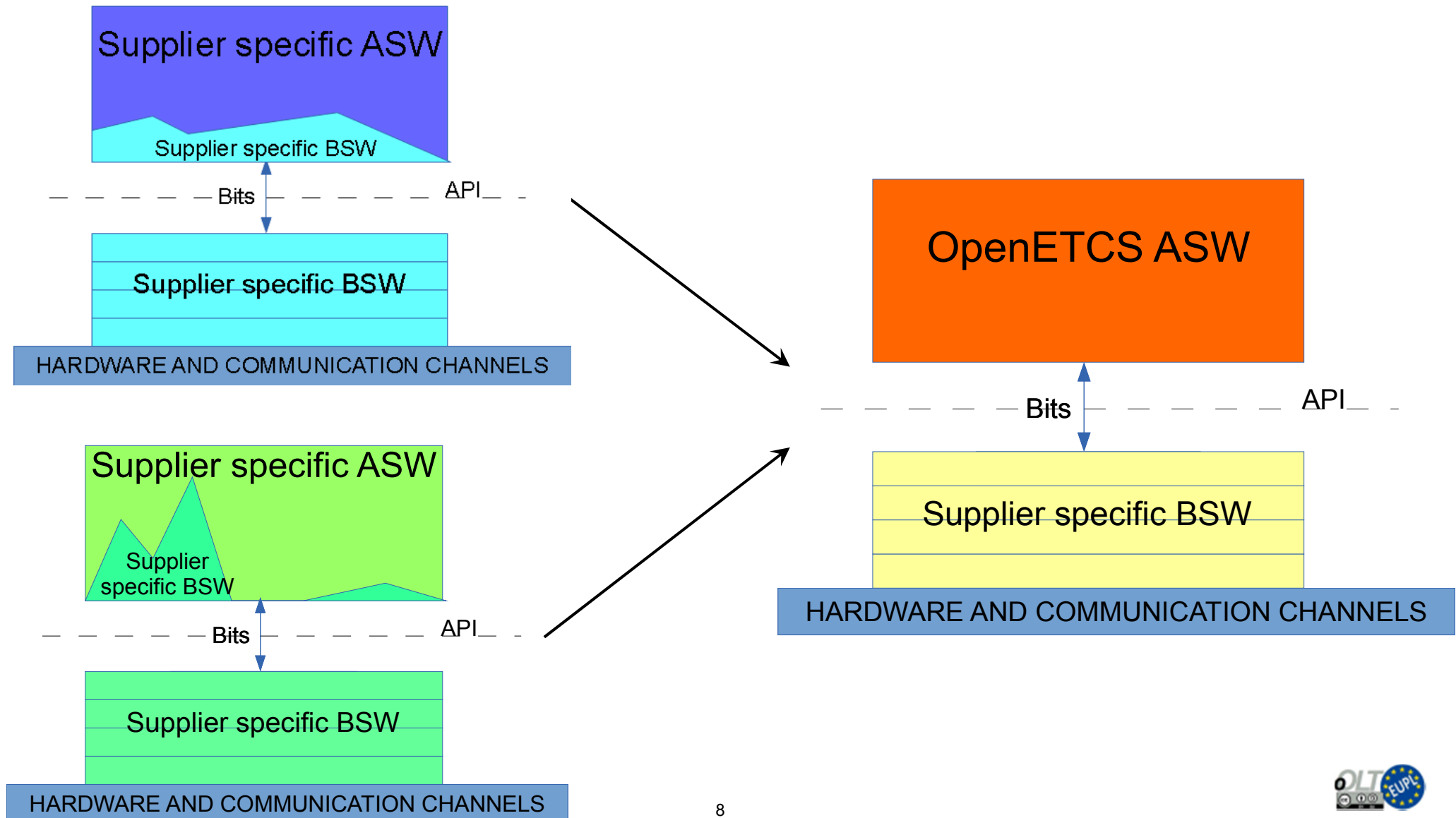
openETCS API: Commercial Requirements

Commercial requirements

- Shall be described to be used for future On Board tender in the railway sector
- Railway are looking for a standardizes set for requirements to be used in the tendering documentation – openETCS inco-operation in requirements specification
- openETCS is already a part of the DB tender documents
- Resistant against functional changes of the specification
- Generic over all suppliers
- No dependencies/communication between subsystems



Transition



openETCS API: Performance Requirements

Performance requirements

- Need to be compliend to ERA Subset 41

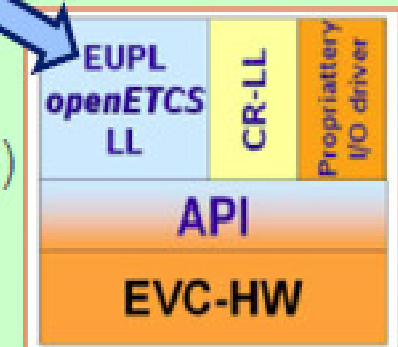
Extra performance requirement from the user:

- STM requirements (Jan Welvaarts/ATBL)
- Time violation shall be avoid

openETCS API: as part of the DB ICE-T tendering document

DB ICE-T tendering document

- Attachment 15.6c (Open Source license according to European Union Public License)
 - In december 2017 Alstom will make available to DB Fernverkehr the rights for **EUPL** licensing of the the software of *ETCS on board kernel* (according to the Unisig Subset 26) in the most recent available version.
 - Contents of License agreement are:
 - Software specification (functional & architectural description)
 - Source code with complete modules
 - Flow diagrams and structure diagrams
 - Data dictionary (definition and description of global variables and constants)
 - API (Application Programming Interface)



openETCS API: Technical Requirements

Runtime Model

Shall provide:

- Memory management
- Execution of state machines (or of the chosen formal model)
- Failures
- Execution between processes and concurrence
- Real time clock

All these can be provided with or without safety properties. This corresponds in fact to the services provided by the „abstract machine(s)“ which runs the models.

API: this is the functions/primitives required to complete the Runtime model. It shall provide the remaining of the features listed hereabove which are not provided by the Runtime model. All these can be provided with or without safety properties

RTM/API: This corresponds to the Runtime Model plus API. Therefore it should provide all the services needed to emulate at abstract level the hardware platform that could run the software.

Functional Architecture: this corresponds to the functional boundaries between the ETCS Kernel and other functional components (JRU, DMI, Odometry, Eurobalise, Euroradio ...). These boundaries are described in the FIS or FFFIS. It also includes the partitioning of the Kernel into different functions.

Requirements on the API/RTM:

The RTM/API

- Model shall provide an abstraction layer of the hardware architecture
- Shall abstract memory management
- Shall abstract the execution of state machine
- Shall allow communication and concurrence (if requested by the model formalism)
- Shall allow to state real time constraints
- Shall provide emulation for a real time clock
- Shall make possible to refine the software into final code able to run on hardware complying the EN 50129 standard for the requested SIL

Requirements on the API/RTM:

The RTM/API

- Shall allow discrimination Vital processing, data and I/O from Non Vital processing, data and I/O
- Shall provide a way of communication between Vital processes and Non Vital processes

Justification: the purpose of these requirements is to be able to discriminate the safety part from the non safety part. It should be made possible to have it run on a proprietary architecture with both software on the same computers. One way of doing this, for example is to have some critical state machines with their data on one side, and the non critical part on the other side, with API channels to make them communicate.

Requirements on the API/RTM:

The RTM/API

- Shall allow fault injection
- Shall allow logging and tracing
- Shall provide a way of reading configuration data (e.g. constants ..)
- Shall provide an abstraction layer of the communication and interfaces with other components

Justification: Even if the FIS or FFFIS requires a specific protocol (e.g. Profibus), this protocol will not be implemented in the high level model. It will be considered that low level communications issues are taken into account (=emulated) by the RTM/API.