



Tideall

*Timing analysis with Capella*

Does my system design match the temporal requirements under all possible circumstances?



What is the worst case response time?

**Software intensive systems**

Is my system schedulable?

- *CPU/network load within boundaries*
- *no deadlock*



- Resources*
- *hardware*
  - *software*

**Capture the "problem"**

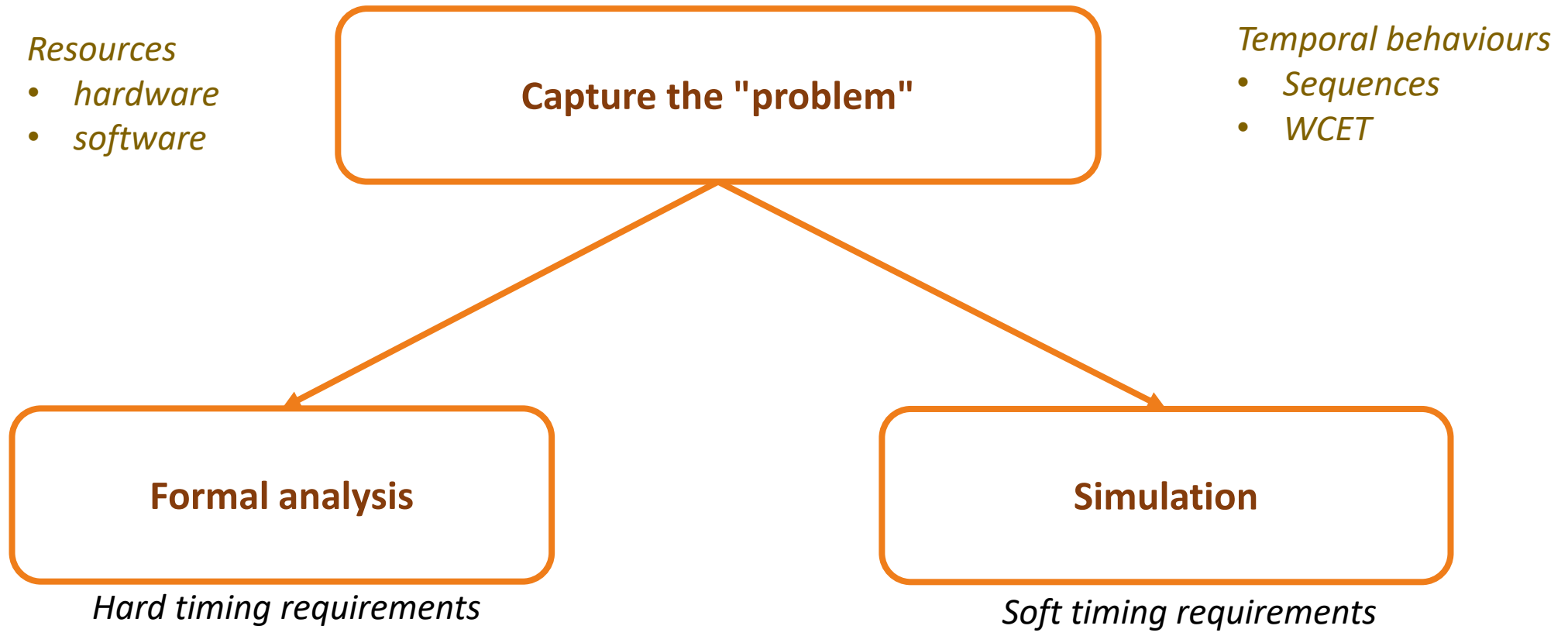
- Temporal behaviours*
- *Sequences*
  - *WCET*

**Formal analysis**

*Hard timing requirements*

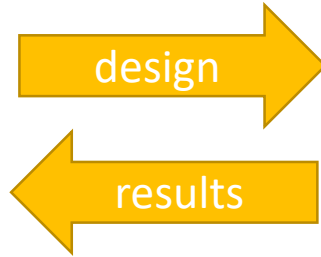
**Simulation**

*Soft timing requirements*



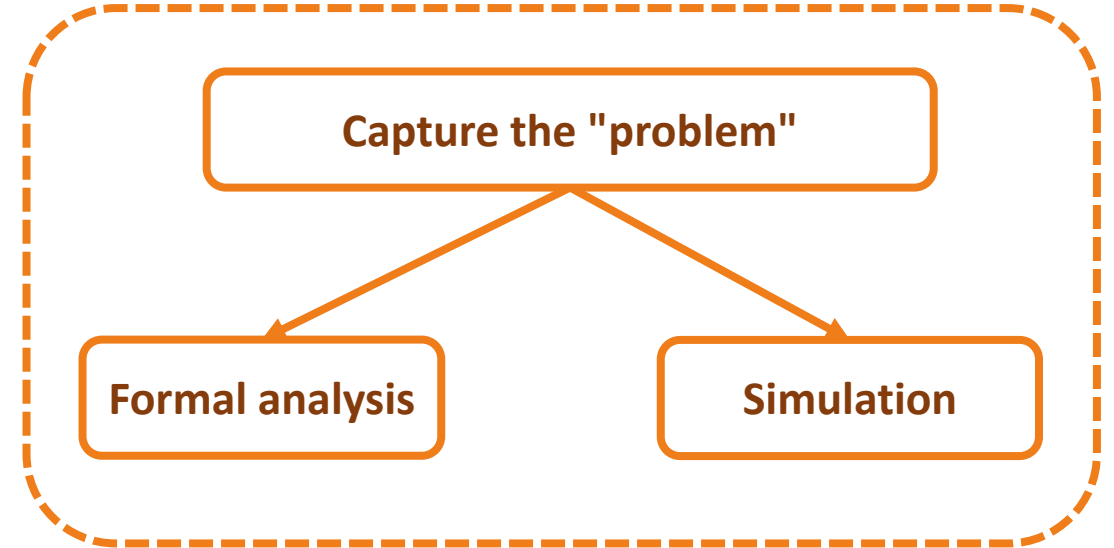


Architect



Expert

Coarse-grain analysis



- Too pessimistic
- Too optimistic: false worst case



- Semantic gaps btw the architect view and the expert view
- Late in the process
- Potentially one tool / expert per problem



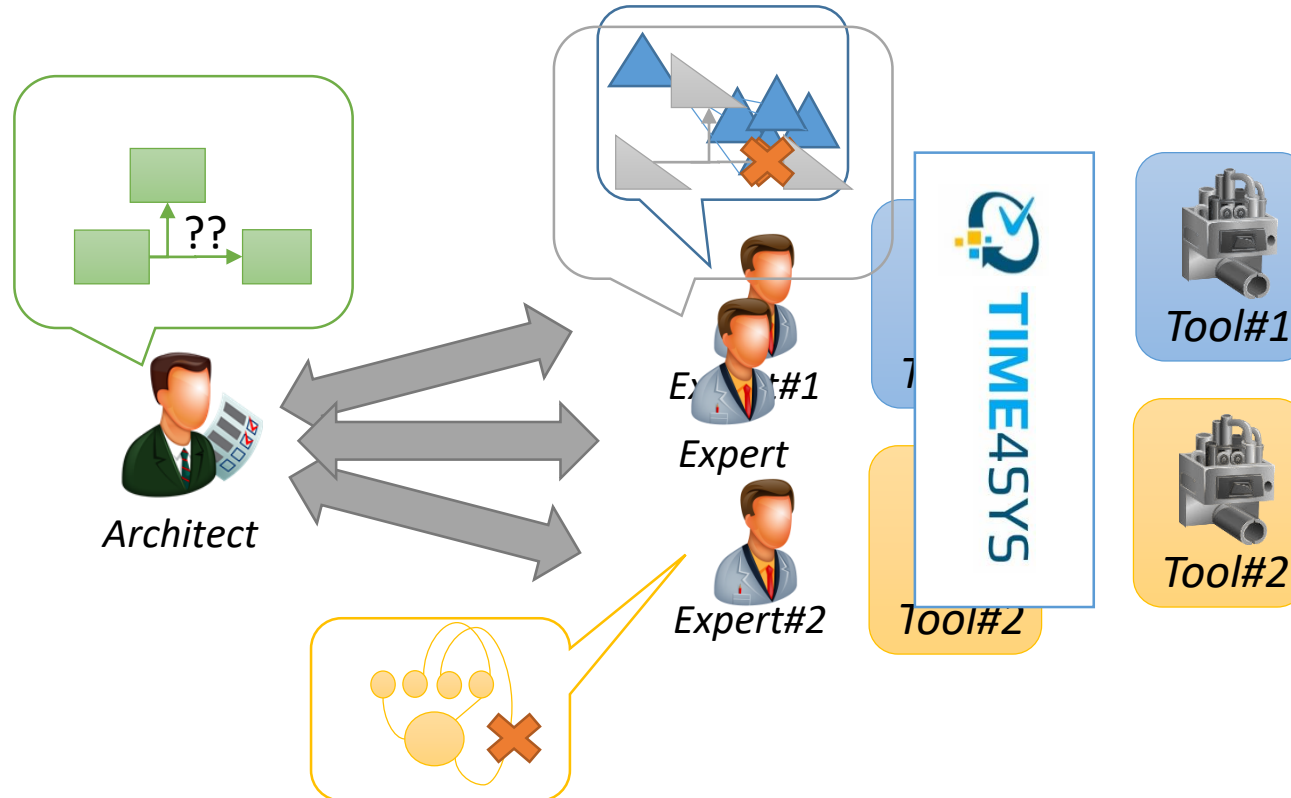
# TIME4SYS

<https://www.polarsys.org/time4sys/>

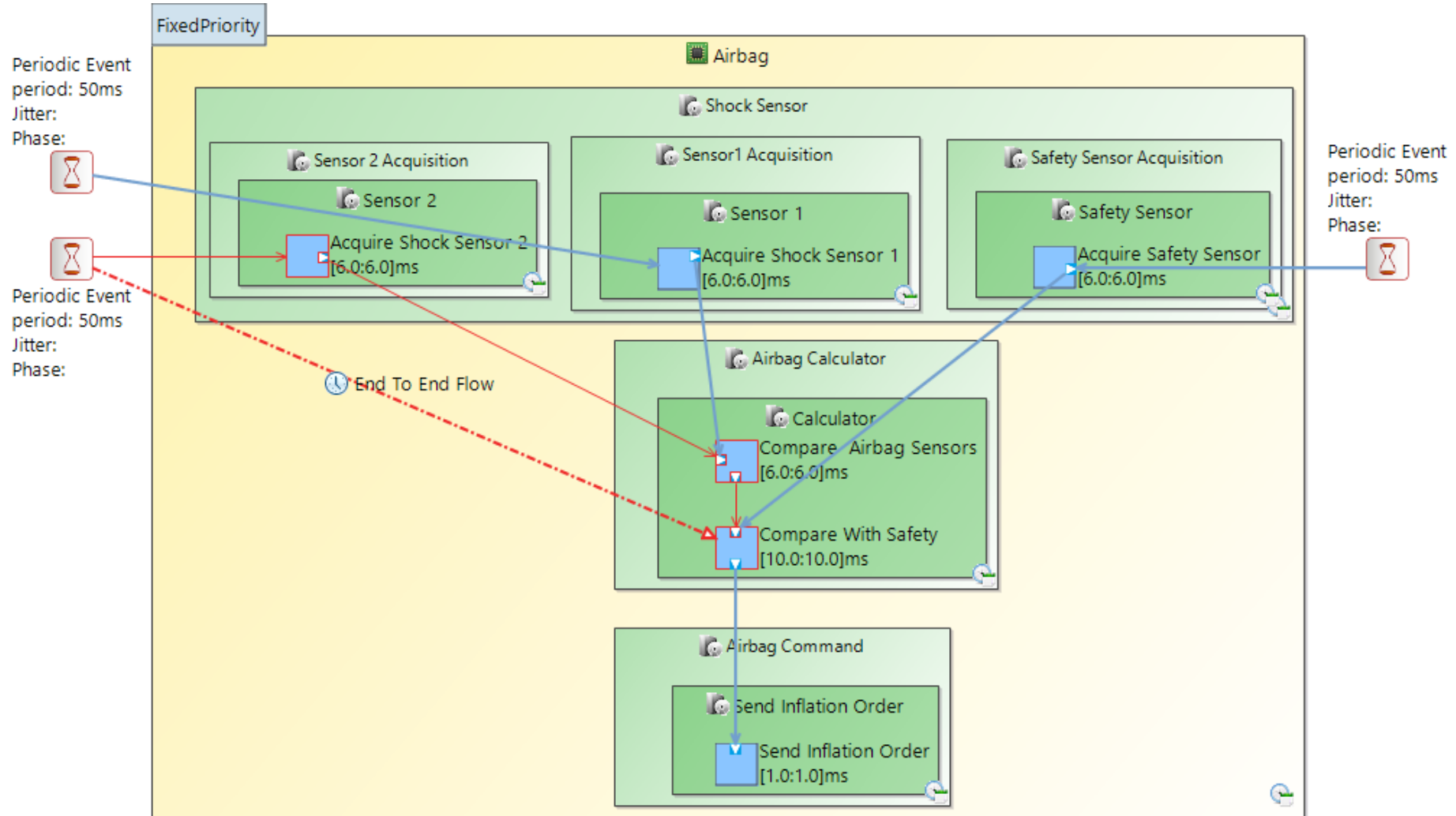
Propose a unified definition for the temporal characteristics of a real-time system  
*together with a graphical representation*



Bridge the gap between the analysis & simulation tools and the design capture



# A modeling framework



# A tools repository

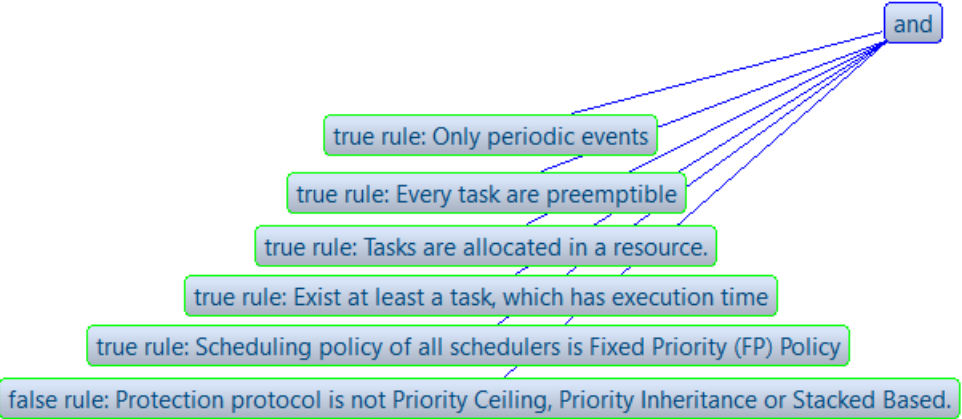
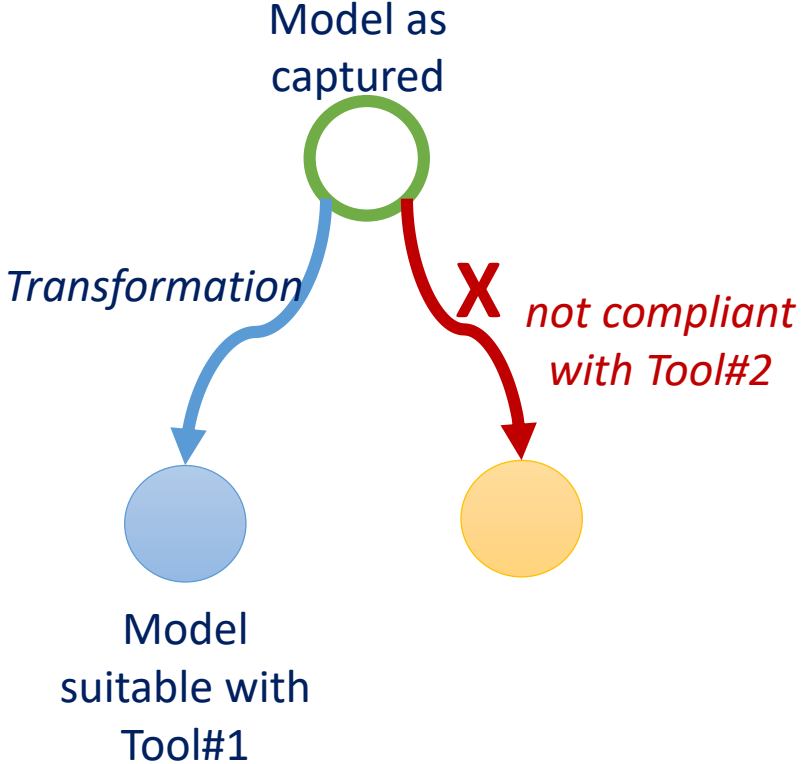
**Result of scheduling analysis ability (Identification process)**

ⓘ This is a recapitulatif of the identification process

Available Analysis Tests | Context Characteristics | Accepted Context Models | Not Accepted Context Models | Inner transformation tests

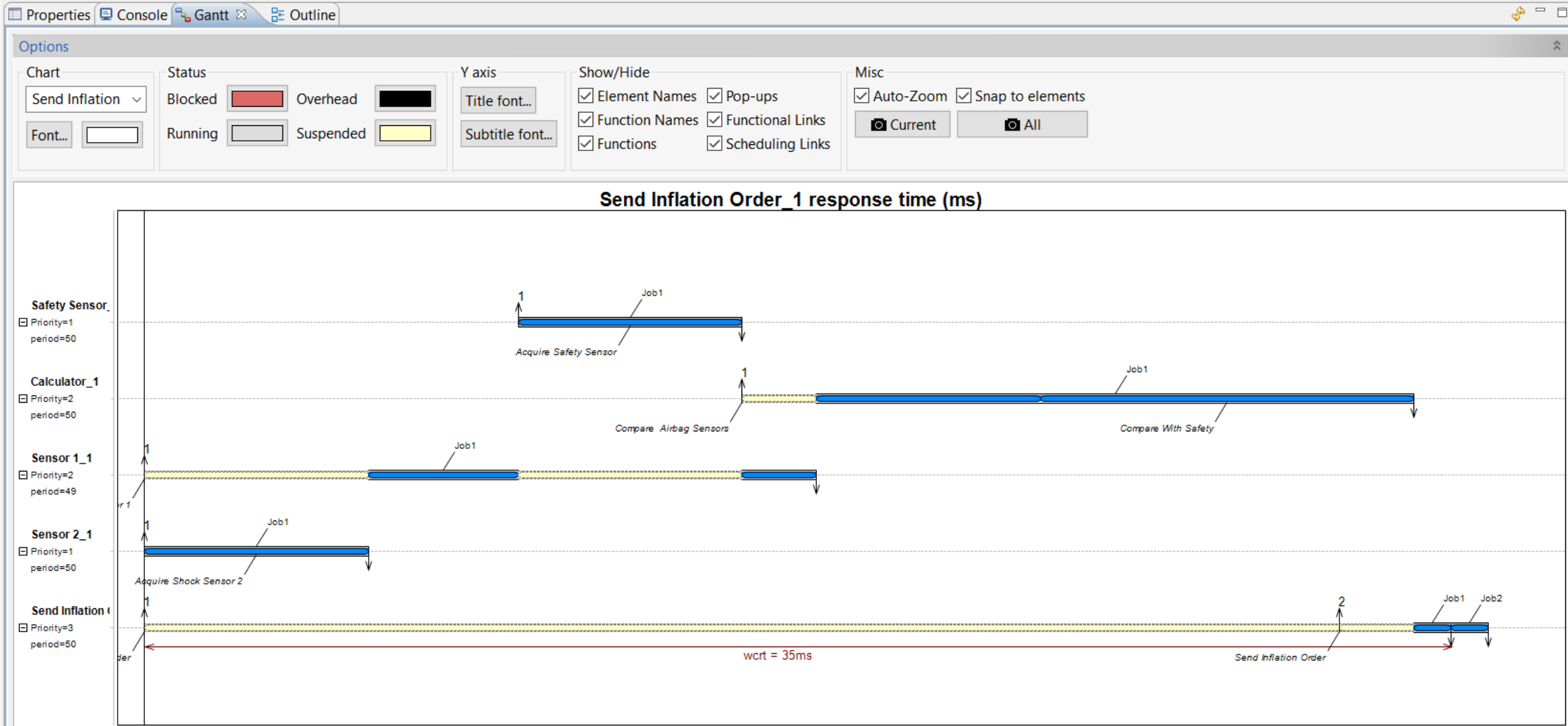
Test Name	Mast XML Default Analysis
Description	Launch mast default analysis
Run	Transformation   Analysis   Transformation and Analysis

ⓘ OK Cancel





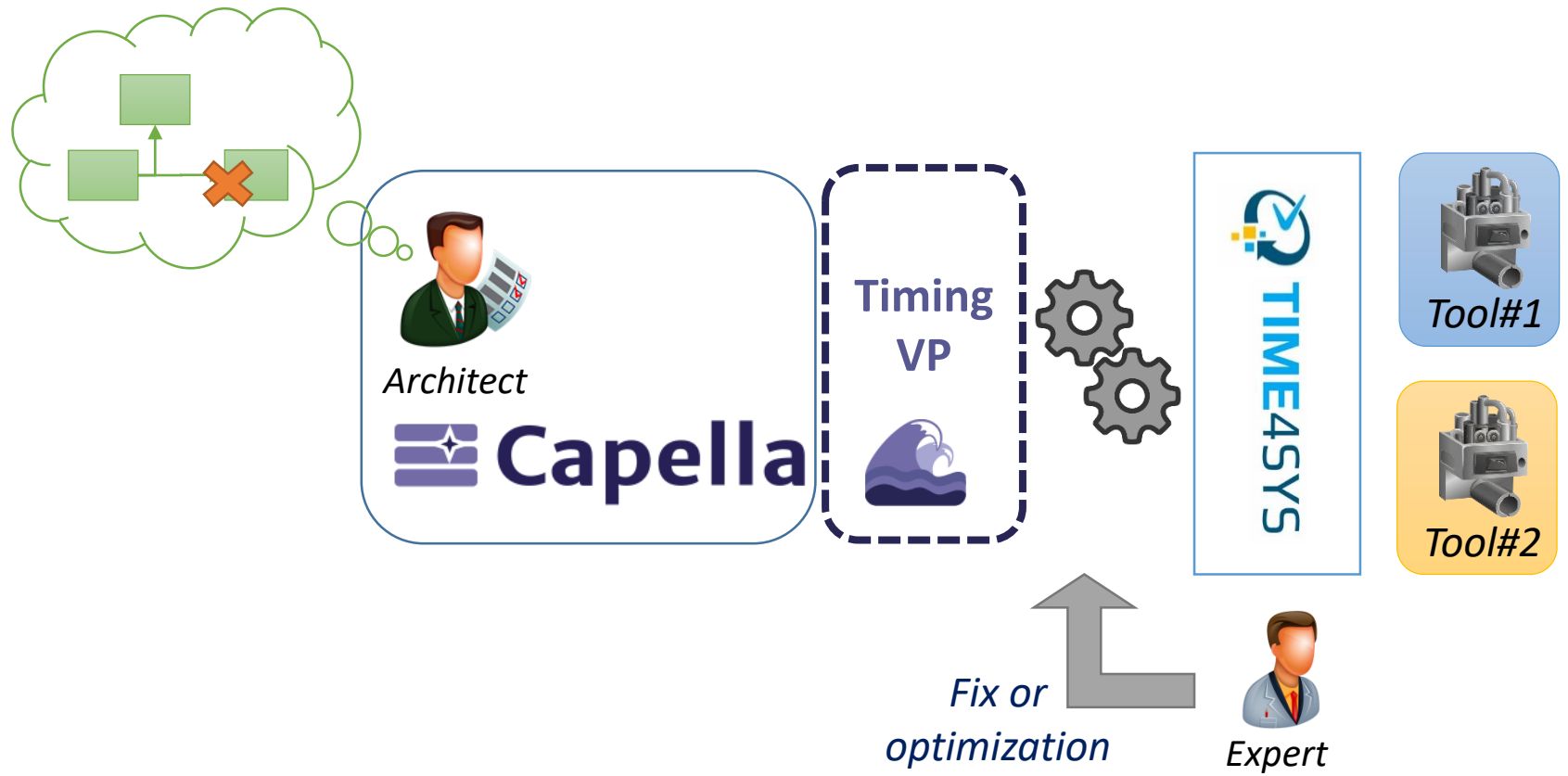
# Visualization of results





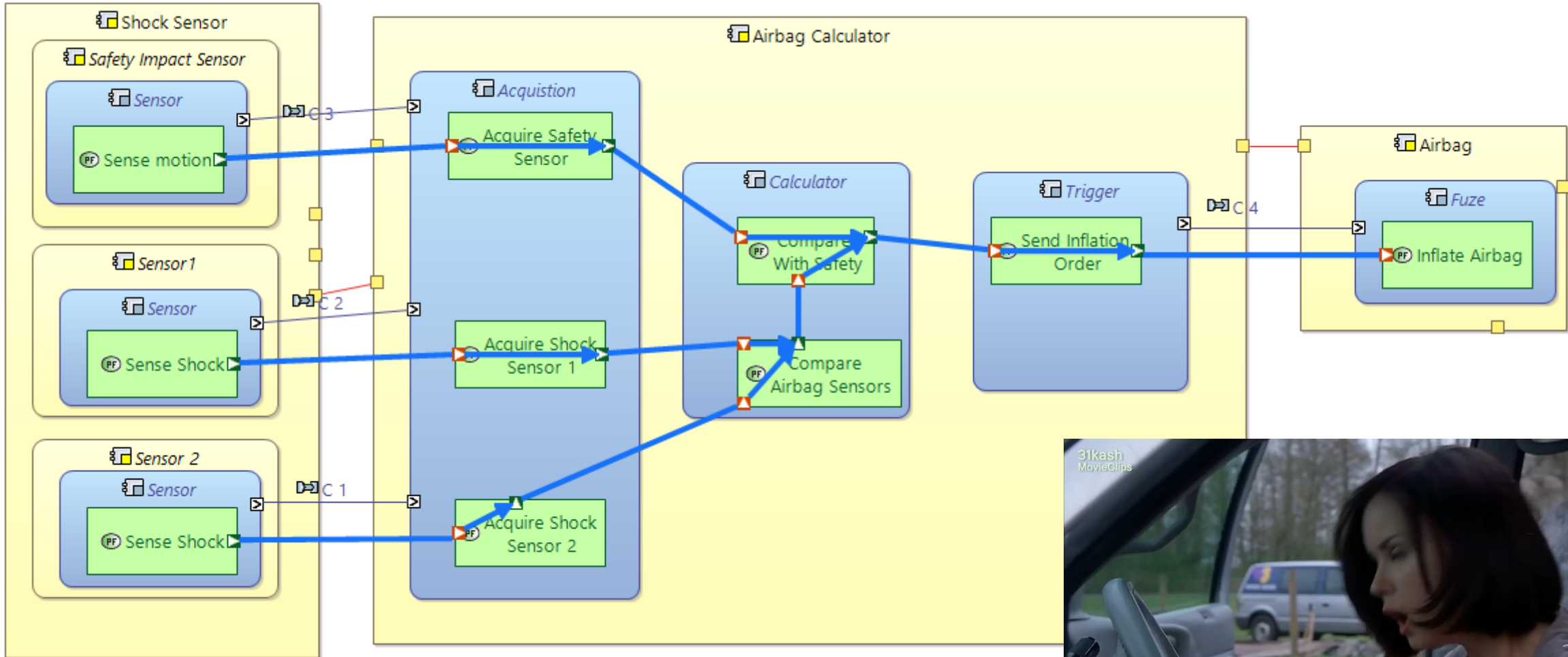
# Tideal

The Time4Sys viewpoint for Capella



*A simple critical system where time matters ...*

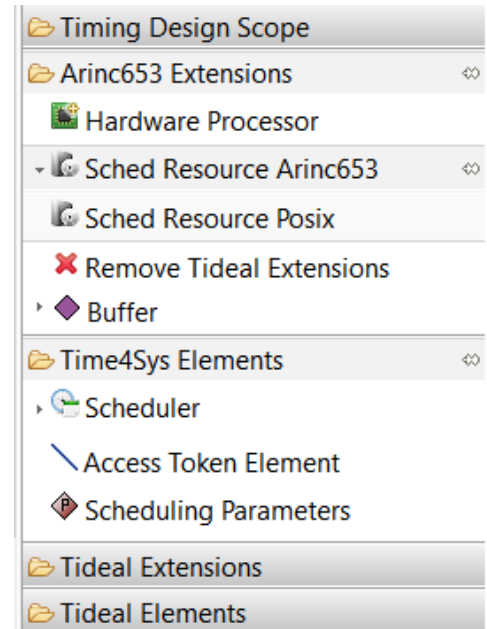




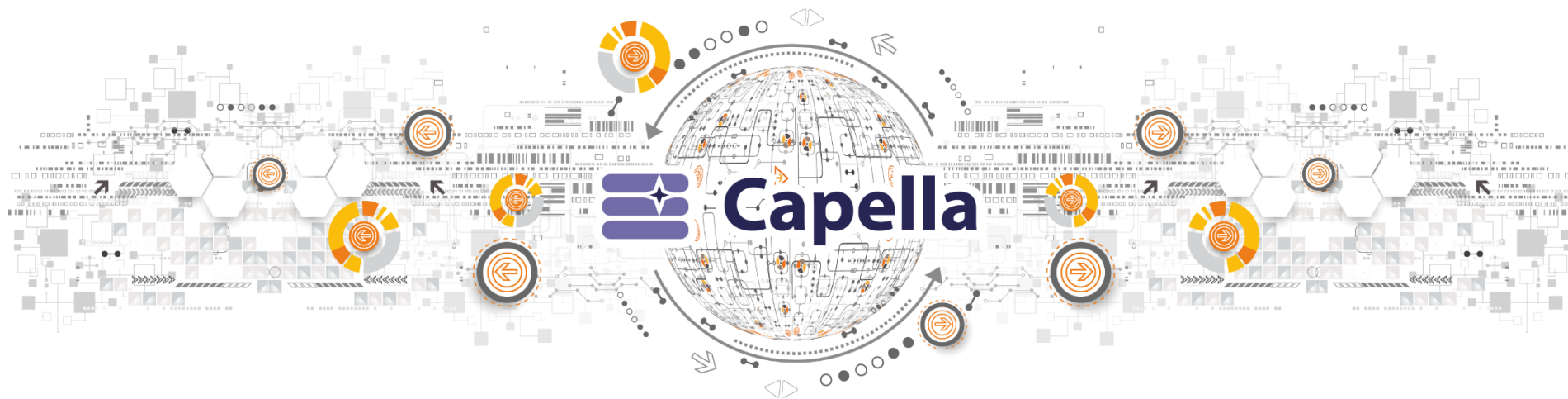
# Demonstration

## Further support for specific real-time framework: ARINC 653

- Enrich the viewpoint with A653 concepts: partitions, tasks, communication mechanisms, ...
- Editing accelerators
- Specific transformation to Time4Sys (from Activity Explorer)
- Dedicated analysis/simulation tool

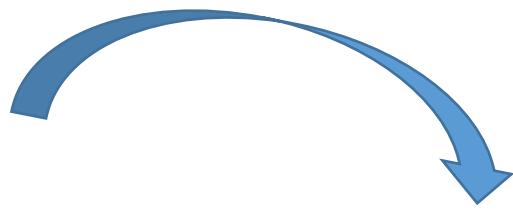
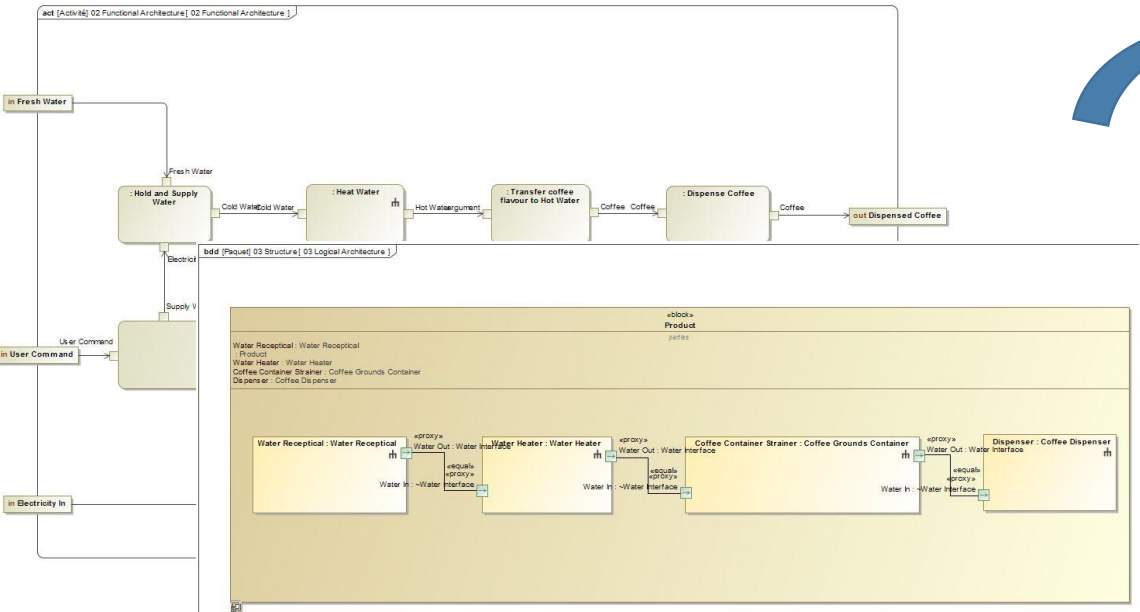


# *Other news for the Capella ecosystem*

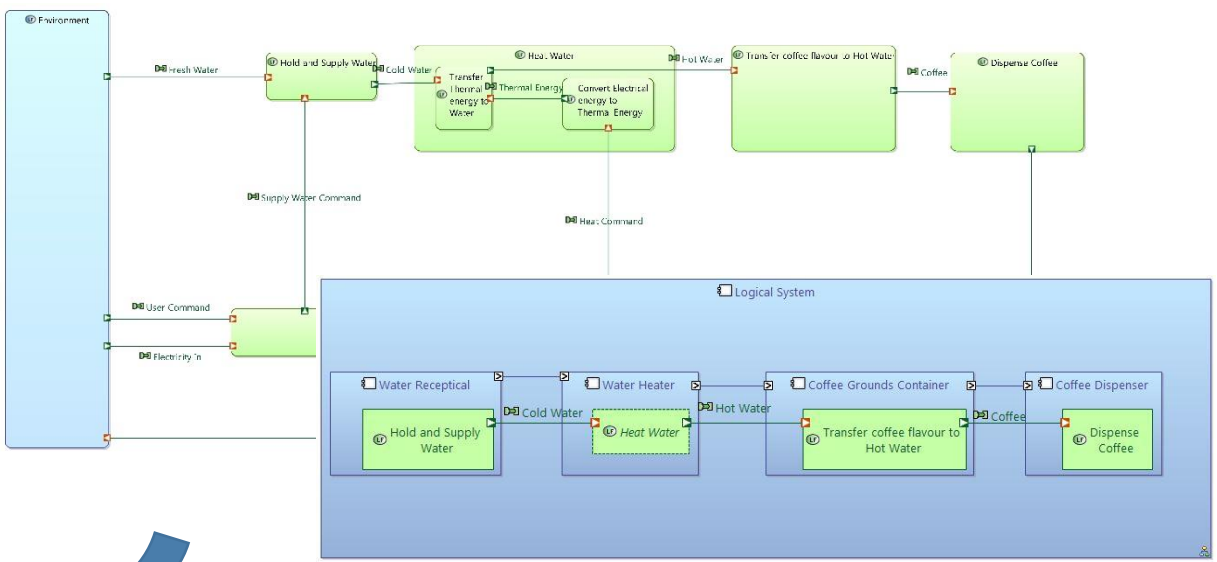




*From Cameo SysML*



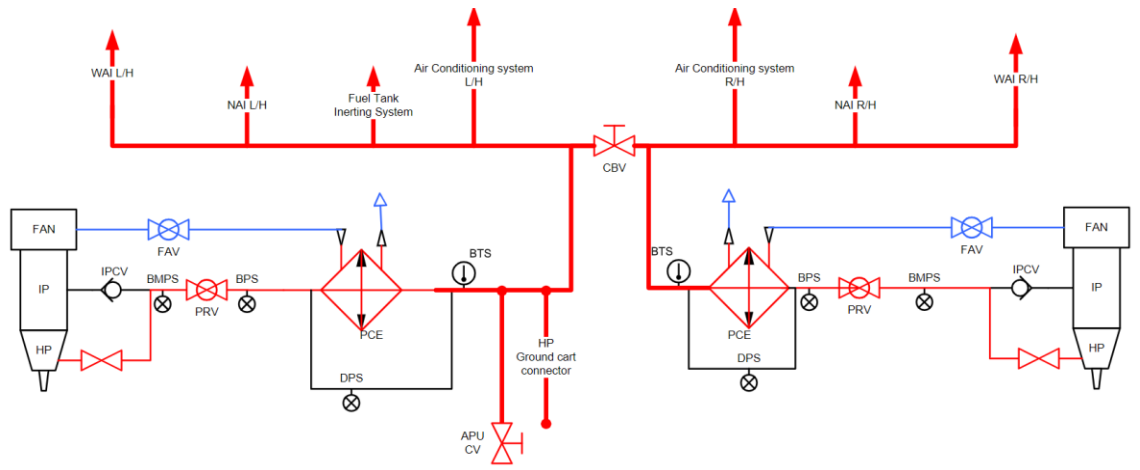
*to Capella*



*and back again*

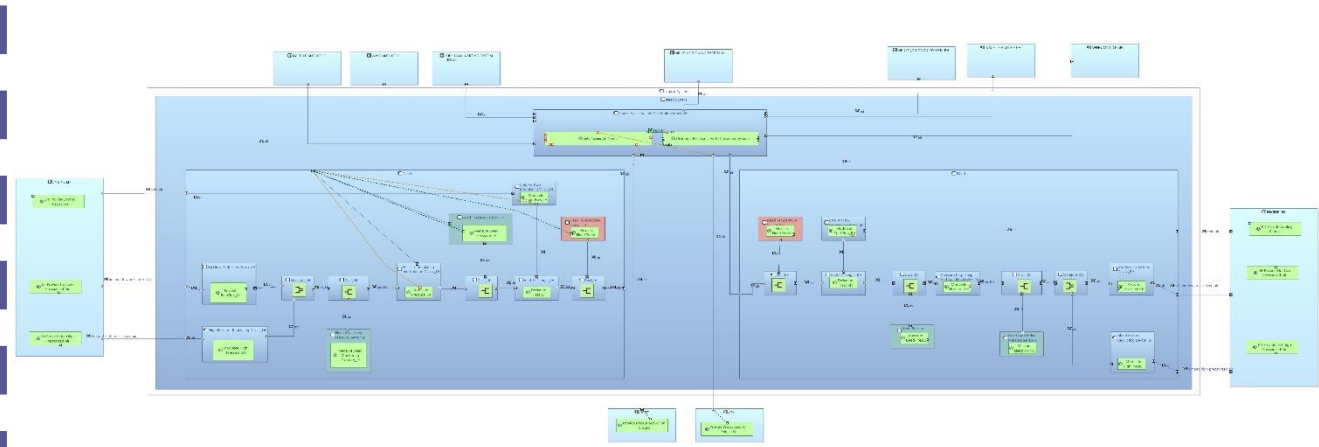
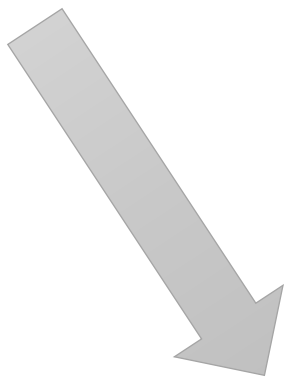
*with iterative support*





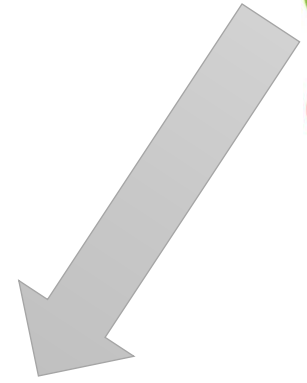
### Microsoft Visio™

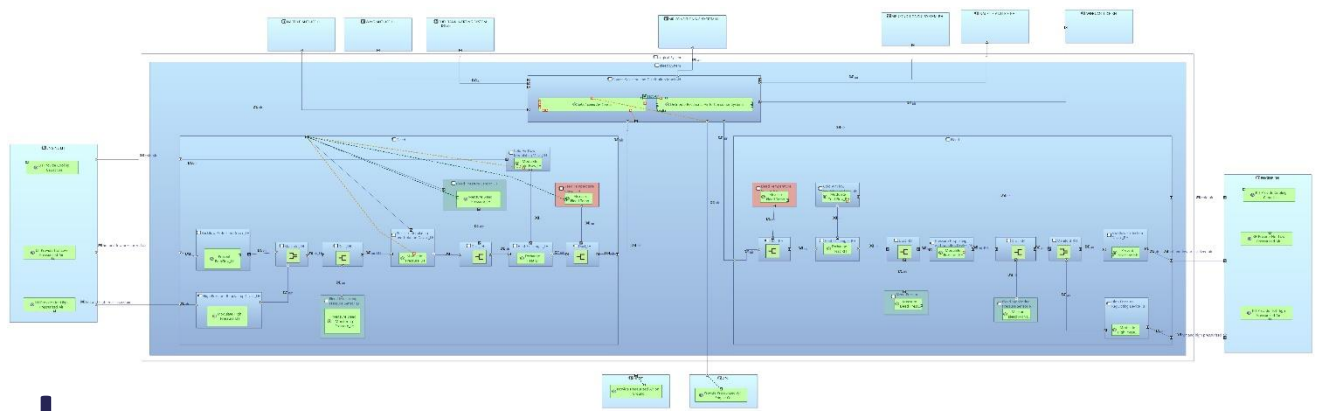
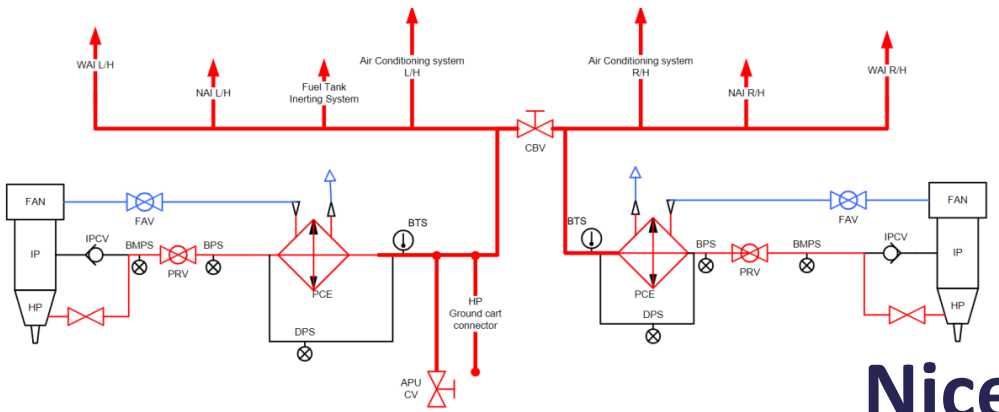
- + Nice views / better communication
- Weak semantics  
Difficult to reuse



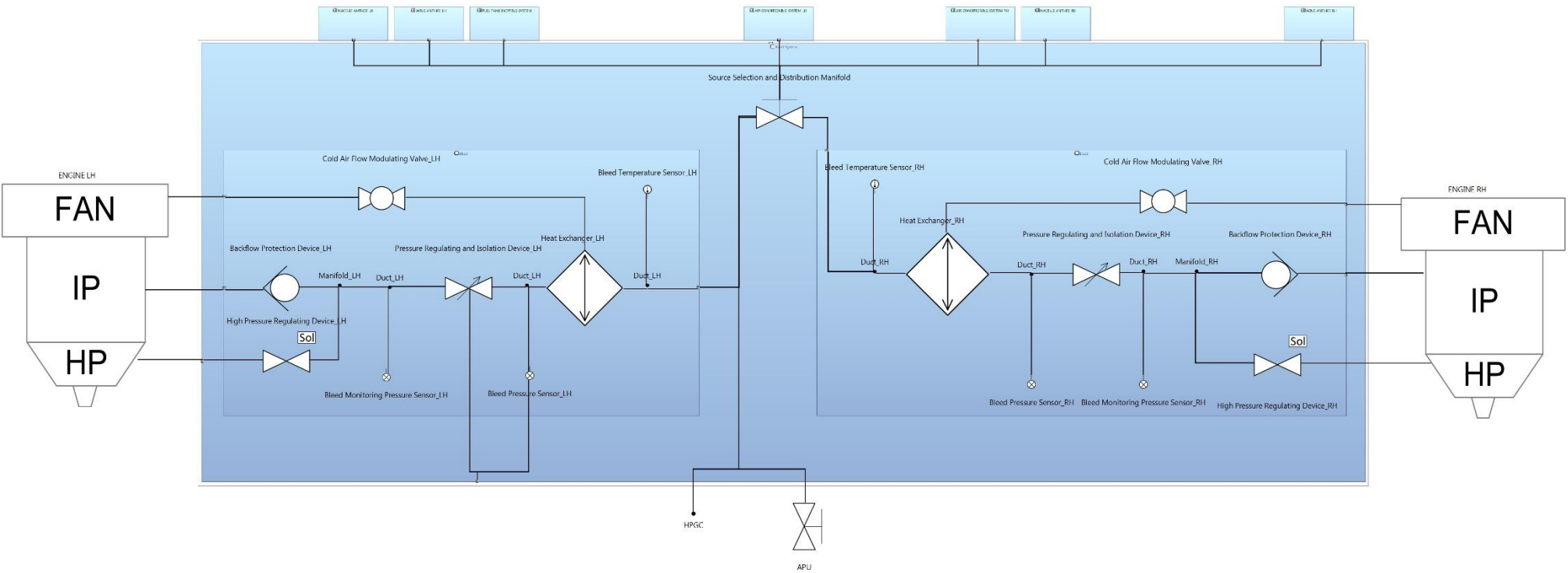
### Capella™

- + Rich semantics  
Digital continuity enabler
- Not so good for communication





## NicerDiag layer



More information on  
<http://capella.artal-group.com>



CAPELLA & ARTAL

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INTEGRATION SUPPORT

CAPELLA EXTENSIONS

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