



Interoperability in Aerospace Public Use Case of CRYSTAL project

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The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) for CRYSTAL – Critical System Engineering Acceleration Joint Undertaking under grant agreement n° 332830

Summary

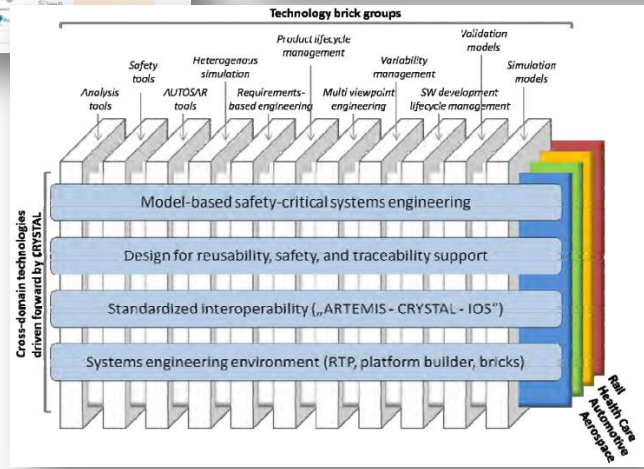
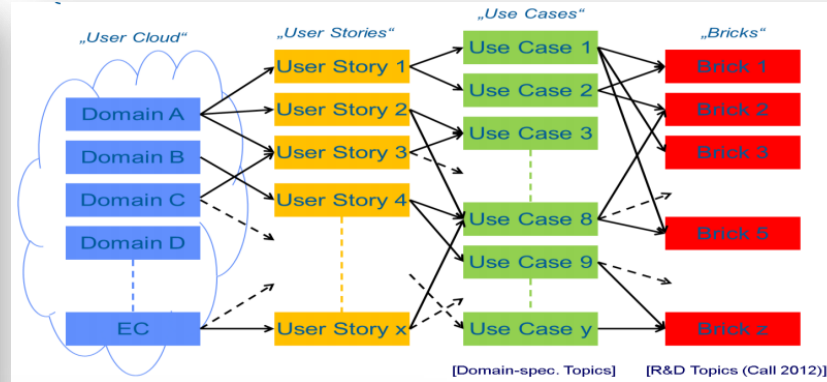


- CRYSTAL Overview;
- CRYSTAL WP2.08: Public Use Case;
- Public Use Case, interoperability example;
- Review and next steps.

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1. CRYSTAL Overview

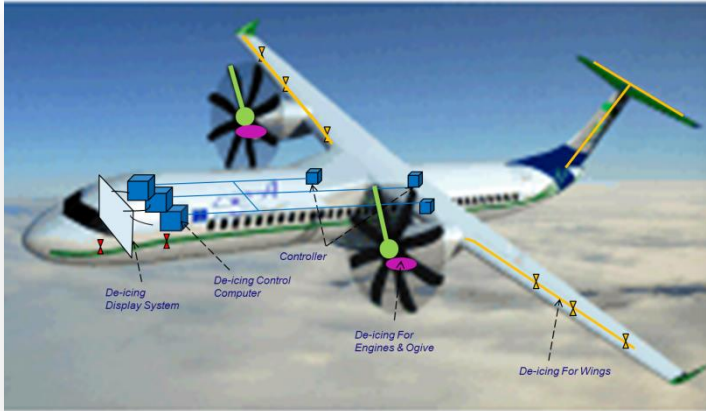
Critical sYSTEM Engineering AcceLeration



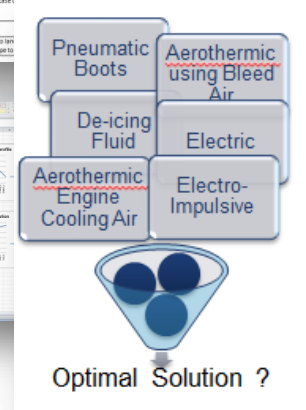
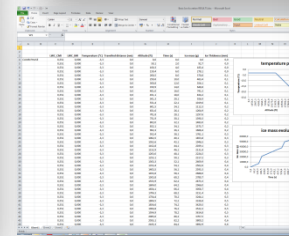
- More efficient design of safety critical systems;
- User-driven approach (Users, Bricks, IOS, RTP);
- 4 critical domains.

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2. CRYSTAL WP2.08: Public Use Case



3.3 Operational Requirements			
SRS_OC_0001	The Ice Protection Sub-system shall permit aircraft operation without restriction in icing condition through "continuous maximum" and "intermittent maximum" as specified by FAR/ARJ25.	True	Operational
SRS_OC_0002	The Ice Protection Sub-system shall permit aircraft operation without restriction in icing condition within One Engine Inoperative condition.	True	Operational
SRS_OC_0003	The system shall provide ice condition information (visual) to the Flight Crew.		Operational
SRS_OC_0004	The system shall provide ice thickness information (visual) to the Flight Crew.		Operational
SRS_OC_0005	The system shall be activated and de-activated from the cockpit panels.	True	Operational
SRS_OC_0006	The system shall support the Flight Crew by providing the activation request message for each operating engine.	True	Operational
SRS_OC_0007	The system shall provide status data information (aero/off) to the Flight Crew.	True	Operational
SRS_OC_0008	The system shall provide operational mode information (aero/off) to the Flight Crew.		Operational
SRS_OC_0009	The system shall provide warning message (aero or visual) to the Flight Crew in case of malfunctioning.	True	Operational
SRS_OC_0010	Slow and fast de-icing cycles shall be provided by the normal control system.		
SRS_OC_0011	The ice protection system shall be operated under all flight phases from take off to land protection is required and taking into account the following temperature envelope to		



- Real Design processes definition (entire product life);
- Engineering Methods definition and allocation over the defined workflow;
- Preliminary Concepts definition (main sizing, behaviour/functional models);
- Trade-off underway;

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2. CRYSTAL WP2.08: Public Use Case



Engineering methods for the Public Use Case:

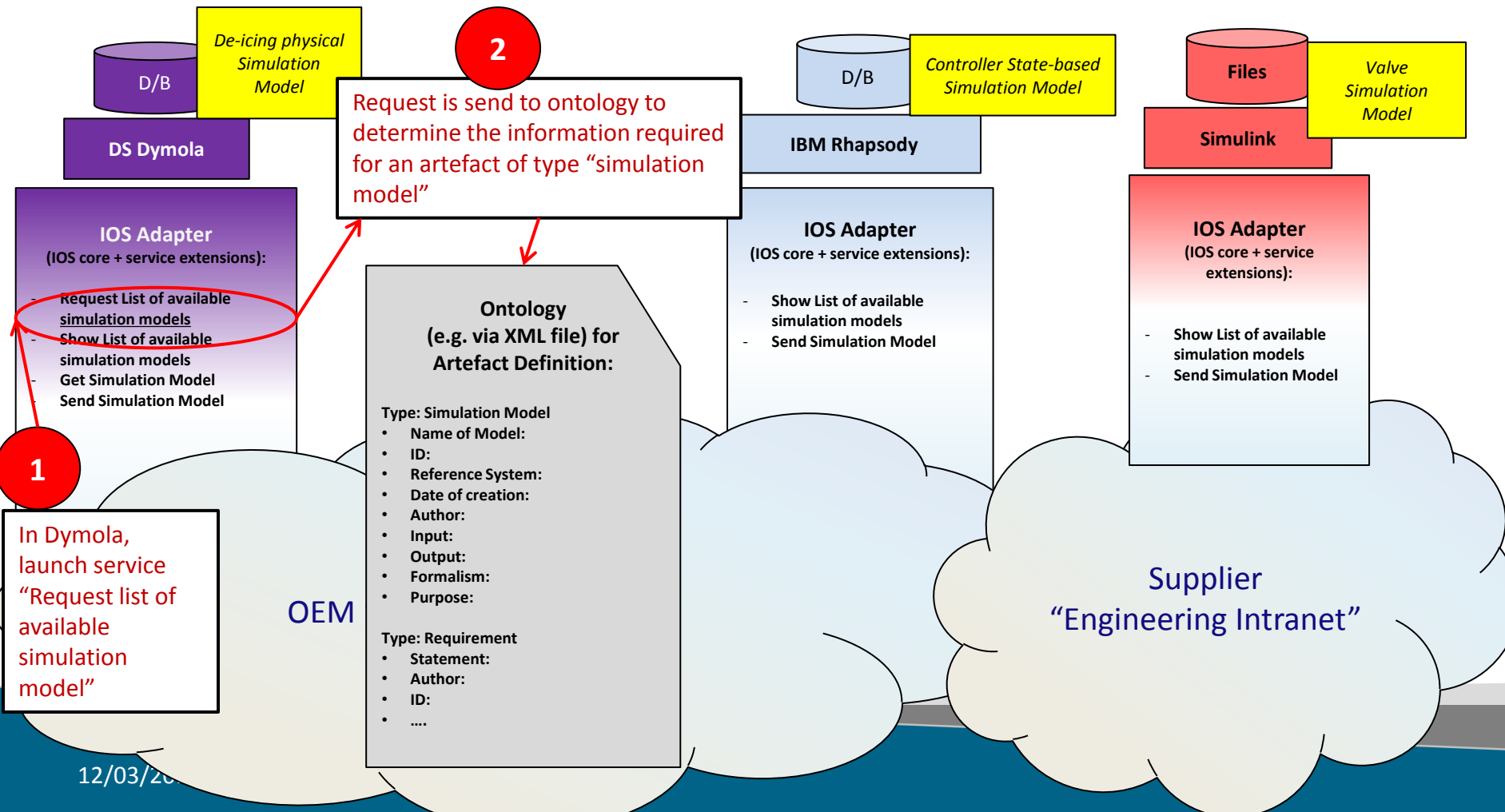
- Analyze Requirements
- Verify Design against requirements
- Fault-tree generation
- Heterogeneous Simulation
- Trade Off Analysis
- Change Impact Analysis
- Maintain Consistency between multi-viewpoint models
- Show traceability between all data
- Provide Process Management
- Put all data under configuration control
- Search Data
- Provide Specification

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3. Public Use Case interoperability examples



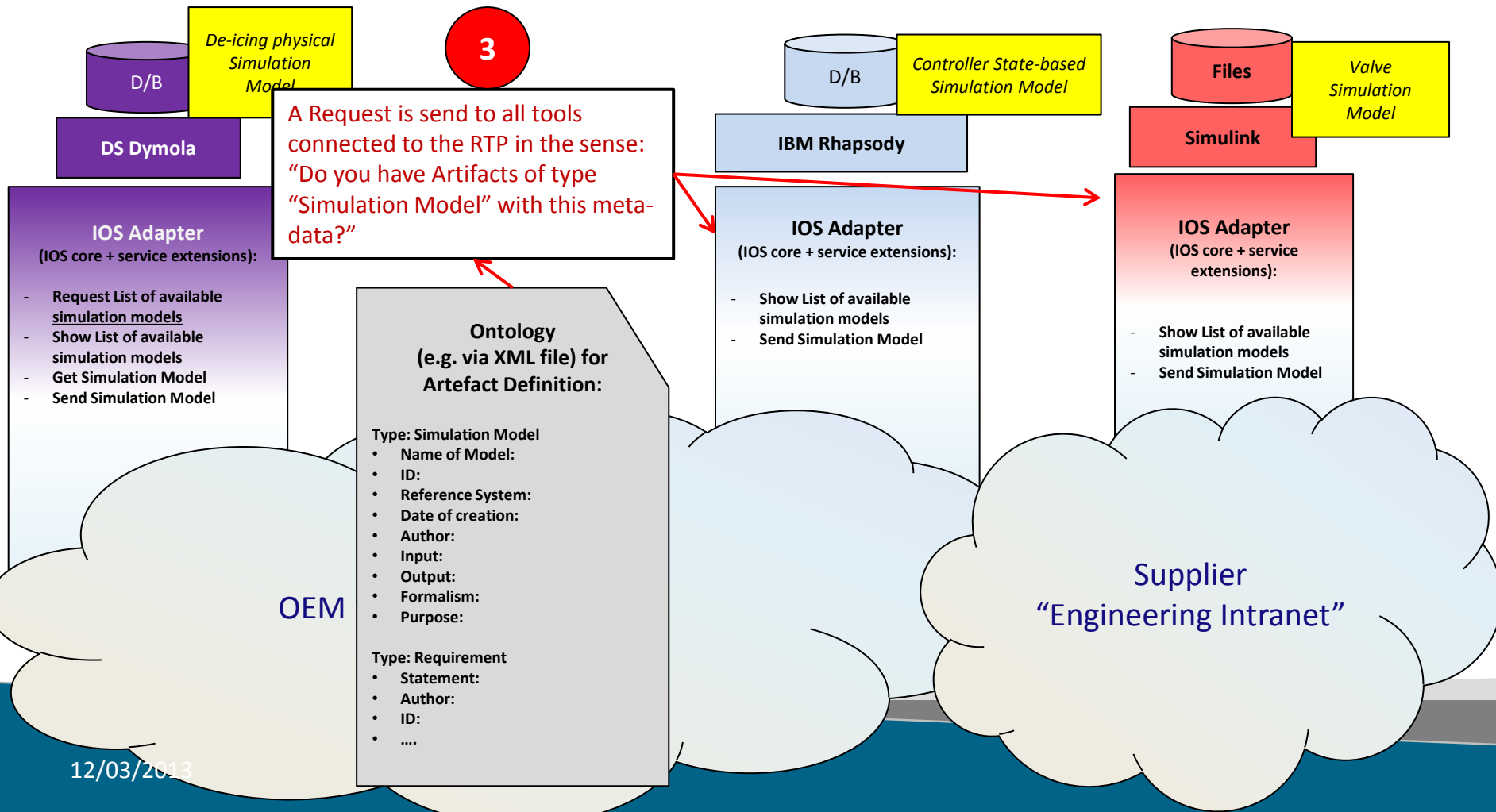
Engineering Method example: Heterogeneous Simulation



3. Public Use Case interoperability examples



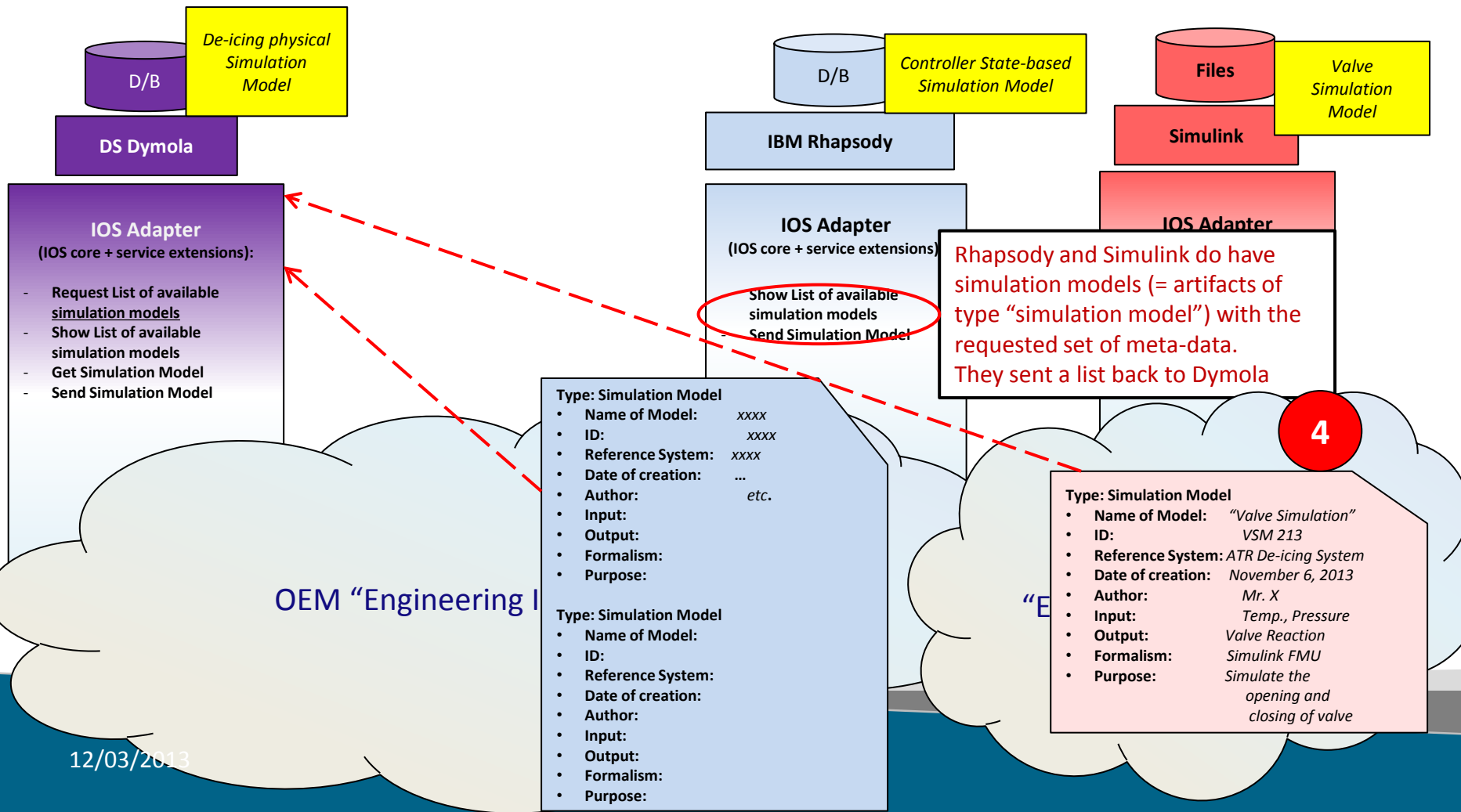
Engineering Method example: Heterogeneous Simulation



3. Public Use Case interoperability examples



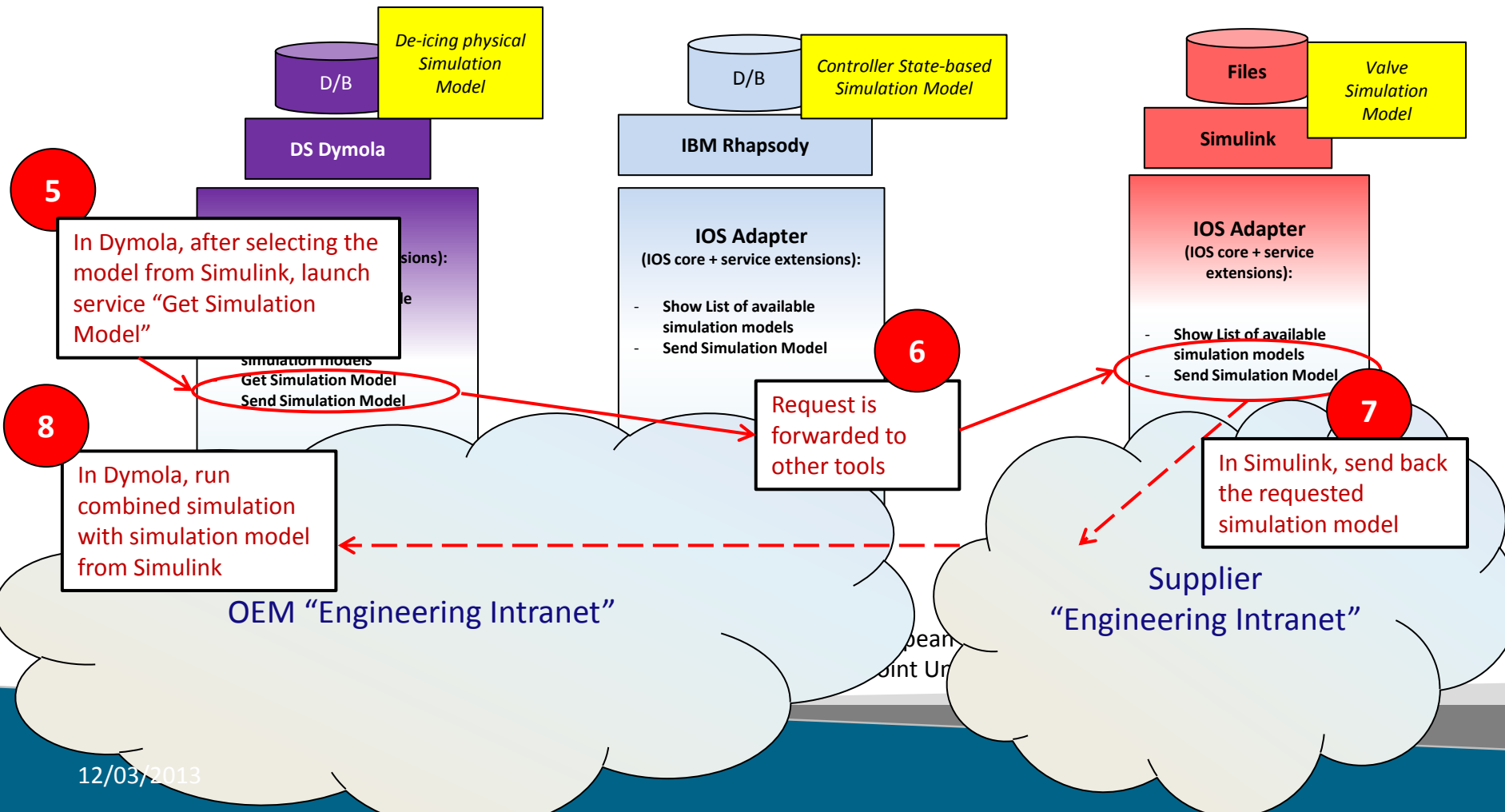
Engineering Method example: Heterogeneous Simulation



3. Public Use Case interoperability examples



Engineering Method example: Heterogeneous Simulation



4. Review and next steps



- First set of realistic data for the de-icing system has been defined
 - ❑ Requirements, top-level functions, concept overviews, concept refinement including refined functional views and product breakdown structures + traceability links between all artefacts
- Preliminary system functional design, as well as Trade off analysis are underway;
- First list of engineering methods defined and mapped on design processes,
- Development of demonstrator is ongoing
 - ❑ So far, traceability/ change impact analysis engineering method has been partially implemented

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