Accelerating Digital Engineering with Seamless Systems Model Exchange

GLOBAL PRODUCT DATA

INTEROPERABILITY

SUMMIT 2025

BOEING ELYSIUM LOCKHEED MARTIN NORTHROP GRUMMAN Parker PDES, Inc.® Connecting the Digital Enterprise

Jeff Pilato – Chief Strategy Officer – Sodius Corp.

Presenters Bio

Over the past several years, **Jeff Pilato** has spoken frequently at the following symposiums and conferences; International Council of Systems Engineers, Global Product Data Interoperability, National Defense Systems and Mission Engineering, Digital Engineering for Defense, MBSE Cyber Systems, as well as numerous IBM ELM events about how the Sodius software solutions aid in enabling the thread of digital engineering for mission/safety critical complex systems.

Jeff's role as the Chief Strategy Officer at Sodius Corp. has spanned about seven years. He has broad responsibilities in supporting Sodius' executive leadership team in defining and executing the company's long-term strategies and key business development initiatives. In addition, he's responsible for Sodius Corp.'s global sales revenues for the systems model transformation business as well as the negotiation of all associated legal agreements.

Jeff has been in business development for almost 40-years and has worked for companies such as Harris, Mentor Graphics, Wind River, IBM, Oracle, and Ansys. His areas of expertise are primarily within the aerospace, defense, and automotive industries.

LinkedIn: linkedin.com/in/jeffpilato

Introduction

Sodius Corp. is a U.S. company and is the global leader in **software solutions for data transformation in classified and non-classified environments, enterprise interoperability, and model-based code generation** to improve data exchange, transformation, traceability, and the linking of engineering data in mission- and safety-critical industries thereby enabling digital engineering workflows.

We're also, totally Trade Agreements Act (TAA) compliant.

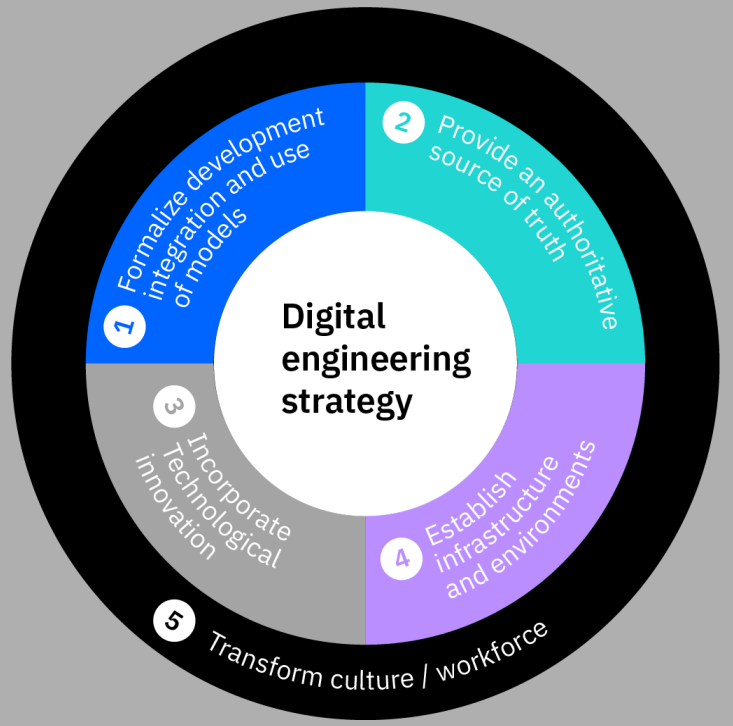
We primarily deploy our solutions in:

- **U.S. Aerospace & Defense Companies**
- **DoD Agencies**
- **Automotive**

Why Digital Engineering?

As stated by the U.S. DoD, digital engineering is now a mandate for improving the efficiency, effectiveness, and affordability of its acquisition programs.

- **Improved decision-making:** leveraging simulations and models that can be used to assess different design options before physical prototypes are built.
- **Reduced costs:** identifying and resolving problems early in the design phase, avoiding costly rework later, and fostering reuse.
- **Better communication and collaboration:** providing a central repository for all project data improves communication and collaboration between different stakeholders.
- **More effective requirements definition:** models ensure that requirements are clear, concise, and achievable.
- **Increased innovation:** fosters exploration of new and innovative design concepts for cutting-edge systems.



"…such engineering environments will allow DoD and industry partners to evolve designs at conceptual phase, reducing the need for expensive mockups, premature design lock, and physical testing."

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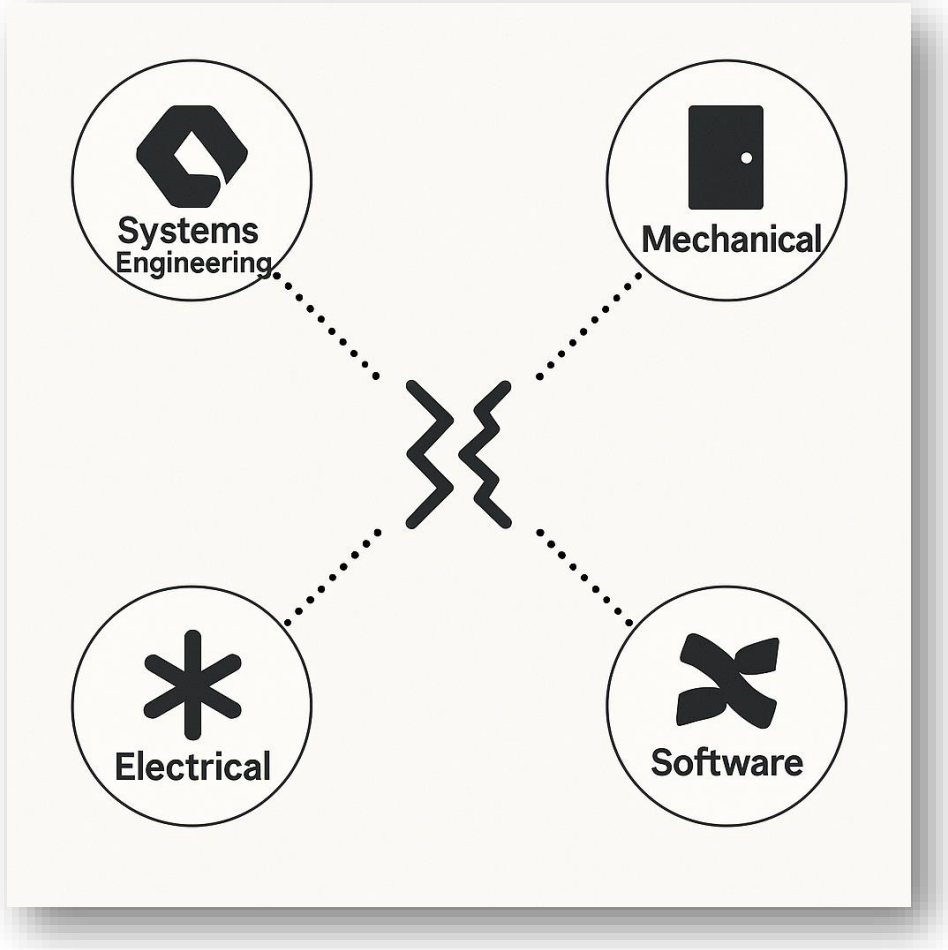
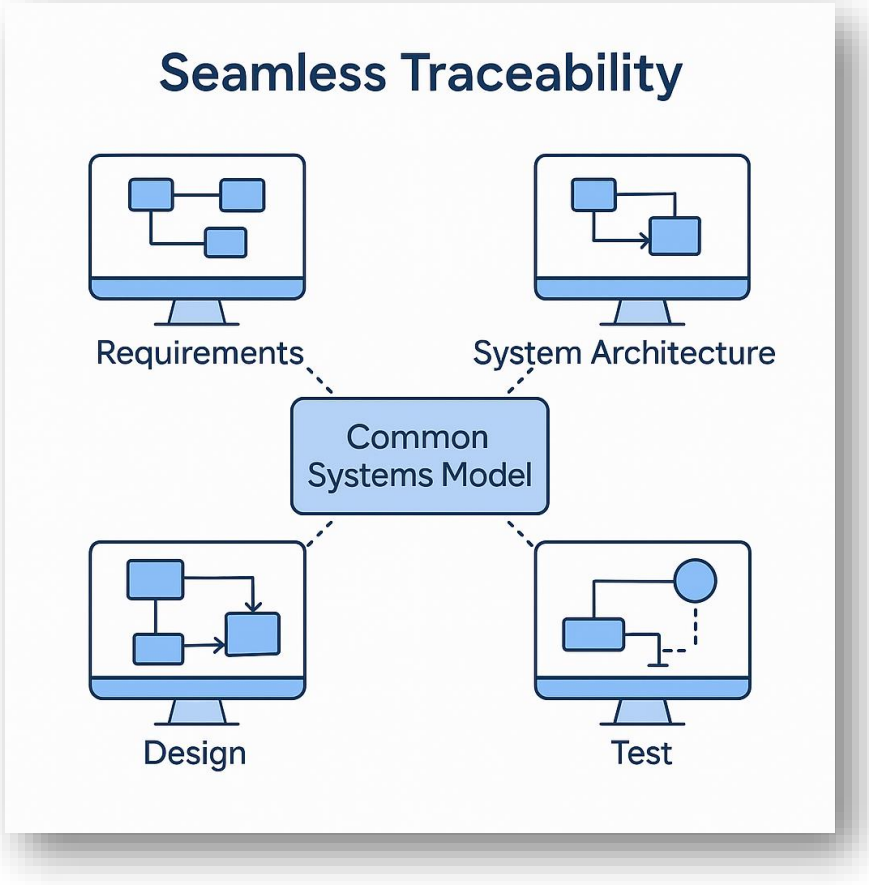
The Challenge: Disconnected Engineering in Critical DoD Systems

- DoD programs rely on critical system models to ensure mission and safety success
- Models must remain accurate, complete, and traceable across tools through the lifecycle phases
- Fragmented toolchains lead to delays, rework, and loss of engineering knowledge
- Manual transformation efforts consume months or even years of skilled labor, introduce risk, and manpower cost
- Engineering teams are still constrained by non-interoperable standards and siloed environments



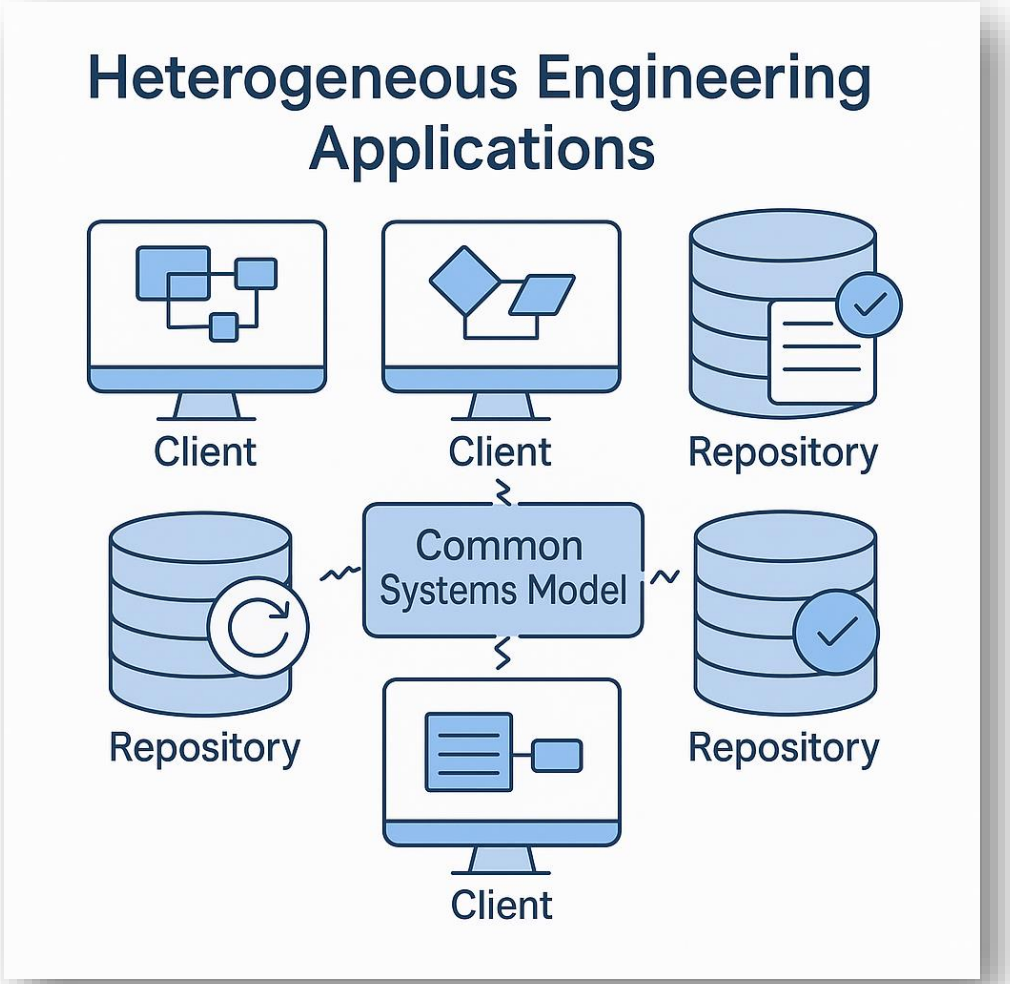
The Ideal Solution for Engineering Data Exchange and Traceability

- Repository-based engineering applications
  - Support of versions and variants
- Individually-addressable elements
  - Version-aware!
- Open API’s to access all elements
  - Fully authenticated!
- Standards-compliant metamodels, profiles, and exchange formats
- Ability to link to external data items
- External reporting of element and link information



The Messy Reality of Engineering Data Exchange and Traceability

- Client-side applications
  - Local persistence
- No support for multiple versions of the data elements
- Lack of an API to access data or different versions of the data
- Cryptic text formats for storage
- Non-standard semantics and exchange formats
- Different usage paradigms of applications across the enterprise
- Closed data models that do not allow external linking

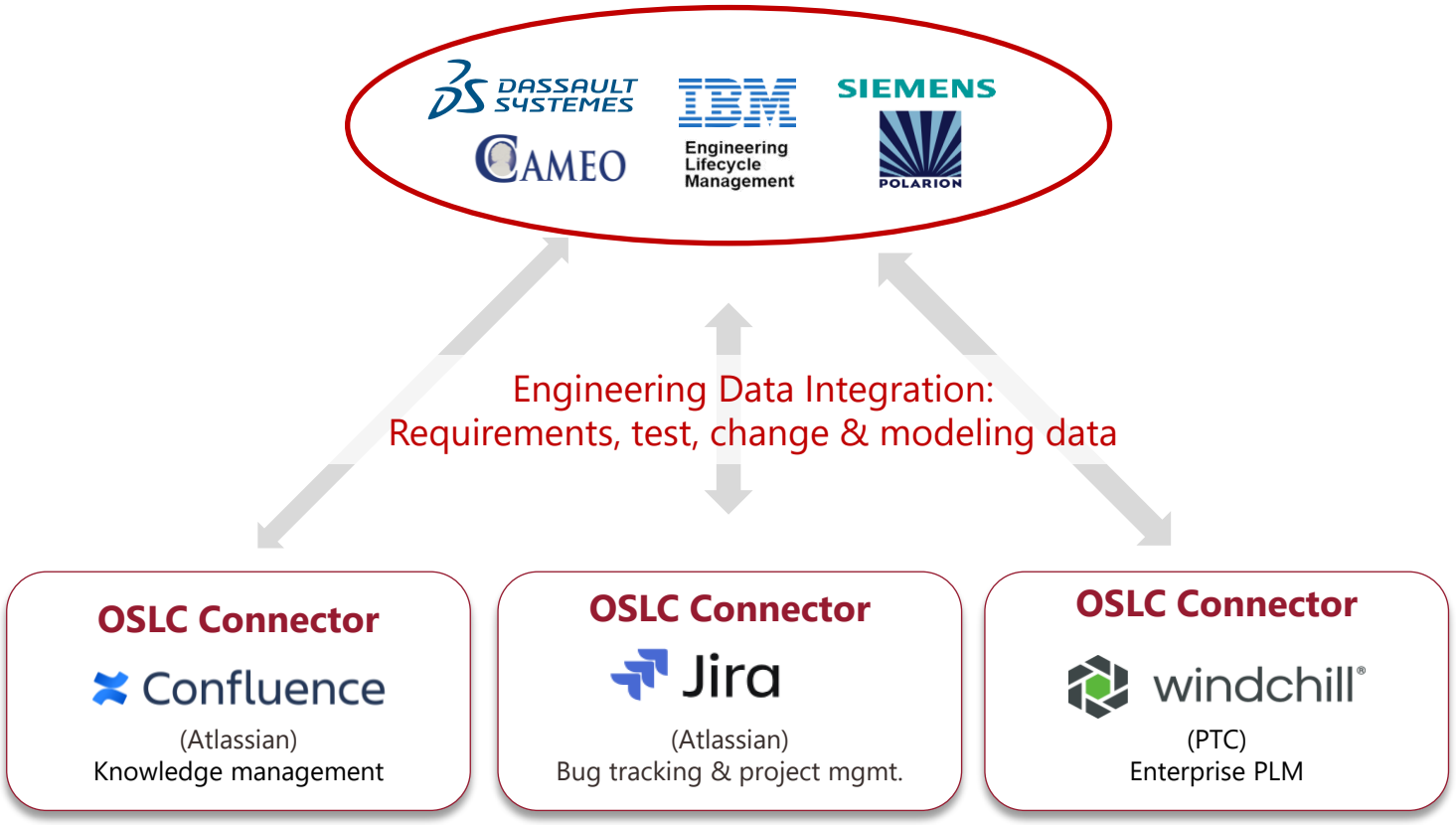


Technologies Required to Connect Real Engineering Data

- Proprietary format parsers and writers
- Custom API extractors and writers
- Semantic mapping tools
- Linked data (OSLC) overlays on existing repositories
- Global configuration managers to manage configurations and variants across applications
- Indexers to report and navigate across the full engineering thread
- Integration with enterprise user management systems

OSLC Connect - Streamline traceability across the team

- OSLC-compliant connectors for Jira, Confluence and PTC Windchill
- Provides linking ability across engineering repositories
- Enables a Single Source of Truth for Engineering Data
- Ensures authenticated access to all data
- Always gets the up-to-date data
- Enables engineers to view external data in their current context



OSLC Connect

OSLC
Inspired by the web

Open Services For Lifecycle Collaboration (OSLC) is a standardized means to integrate data between engineering applications without synchronizing or copying data

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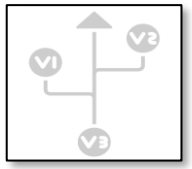
SECollab - Manage Engineering Collaboration

- **An aggregation platform for engineering teams**
- **Collect, link, configure, and visualize digital viewpoints**
- **Generate traceability, create compliance reports, and perform collaborative multi-tool reviews**

Collect

Aggregate and share data, document and model content from any tool



Configure

Configure versions locally and globally

Link

Link and connect configured data to enable end-to-end traceability

Review

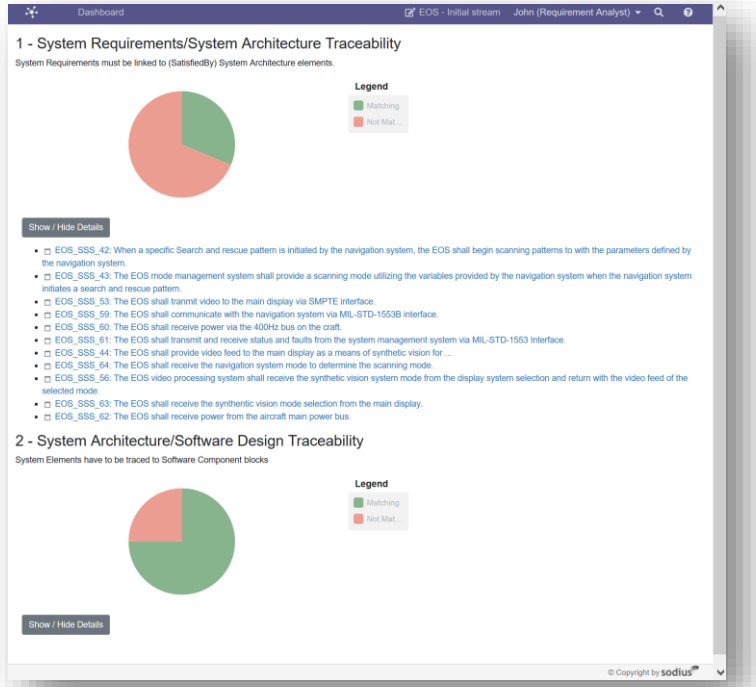
Review heterogeneous set of data and link findings with CM system

Visualize

Visualize data among various viewpoints

Report

Monitor compliance using real time reporting



SECollab

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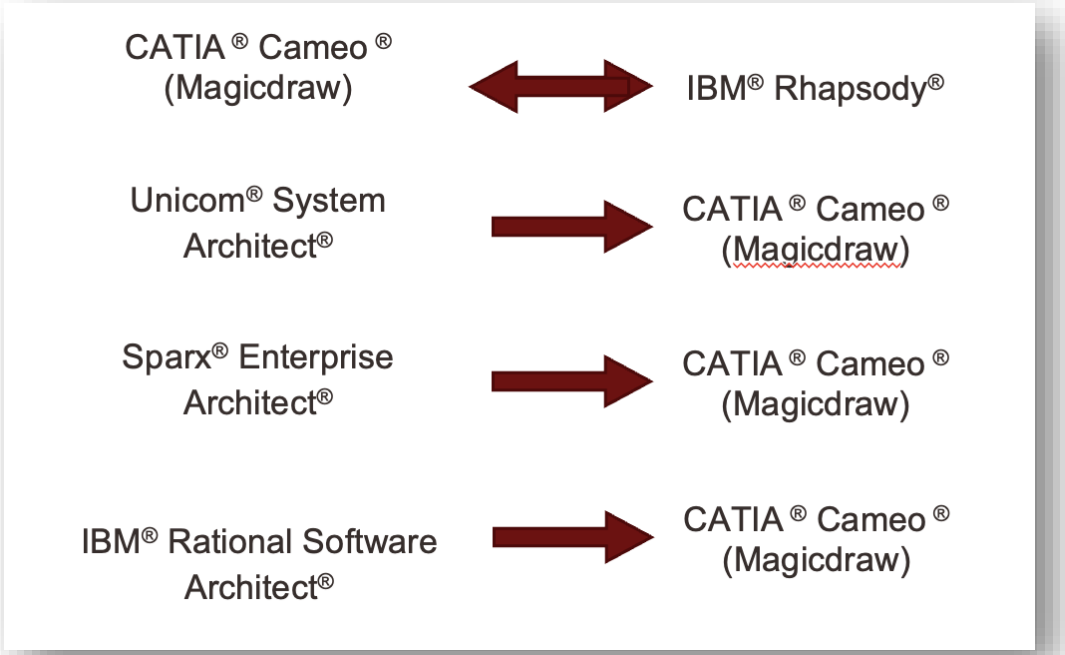
Publisher – Systems Model Exchange between Modeling Tools

- **Sodius Publisher family of products are the only fast, automatic, and proven solutions used to overcome systems model exchange challenges**
  - End-to-end model interoperability
  - Automated, fast, and standards-compliant exchange
  - Designed for mission- and safety-critical systems
  - Design in one modeling tool and deliver in another
  - Migrate from one modeling tool to another



How do you get years of modeling IP exported and imported quickly?

How do you transfer data consistently and accurately for very large models?

How do you transfer thousands of diagrams?

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Customer Proof Points

Raytheon
Integrated Defense Systems

Content to export: 200 diagrams, 18,000 elements.

Expected time w/o Publisher: “a quick computation leads to 18 weeks of remodeling and validation without the reproducibility and confidence brought by automated solution.”

Total time to export: ~ 1 hours

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"By leveraging the MagicDraw Publisher for Rhapsody, the total time to export the end-customer deliverable was less than two hours.”

Chris Finlay – Project Manager

Content to export: 37,331 files in Rhapsody UML format with 812,405 elements and 703 diagrams

Expected time w/o Publisher: ”This kind of transformation, if done manually, would take man-years to complete.”

Total time to export: Less than half a day

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“The Publisher for Rhapsody quickly enabled us to automate the migration from Rhapsody UML models to Cameo/MagicDraw SysML models.”

Sean F., Dynetics Project Manager and Lead Systems Architect
Redstone Arsenal

NORTHROP GRUMMAN

Content to export: 220,000 elements and 300 diagrams in Rhapsody SysML

Expected time w/o Publisher: ”Redoing an entire model that months were spent on because of tool changes, would have been a huge waste of resources.”

Total time to export: 20 minutes

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“We like it, and the management is very pleased. Redoing an entire model that months were spent on because of tool changes, would have been a huge waste of resources.”

Maxwell Yavaraski., Principal System Engineer

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How Publisher family of products have helped our customers

SAVE ENGINEERING TIME
(faster)

Save months or years of critical engineering resources converting and validating manually re-written models.

With the **Publisher for Rhapsody or Cameo model Importer for Rhapsody**, users can **automate the export and publish models** to meet industry standards within minutes or hours.

MAINTAIN DATA INTEGRITY
(better)

With a fully automated transformation, data is checked and converted consistently within and between projects, in a **reproducible** way.

Any transformed data is uniquely identified **preserving traceability** after the conversion.

INCREASE ROI
(cheaper)

By converting semantic and diagrams in the transformation process, you preserve the modeling intent. Your **engineering added-value is transferred to your new target environment increasing the ROI of modeling activities** in your organization by saving months to years of manual re-modeling.

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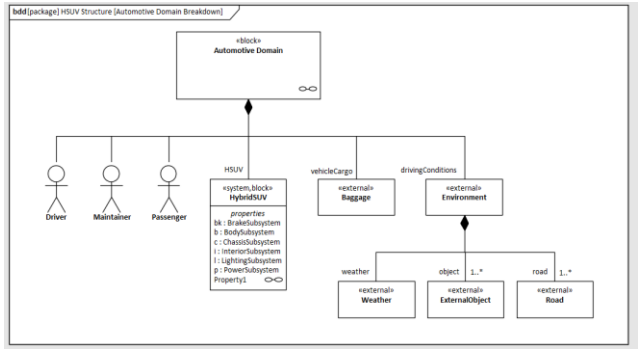
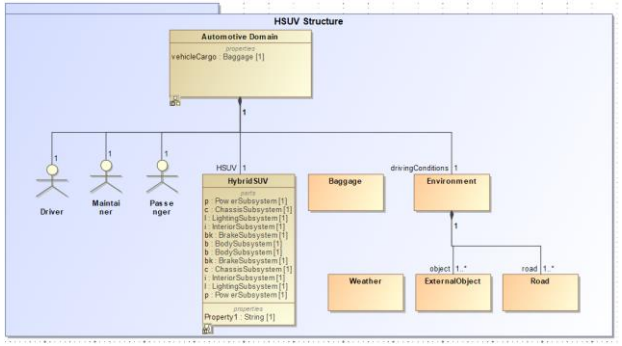
Main Features

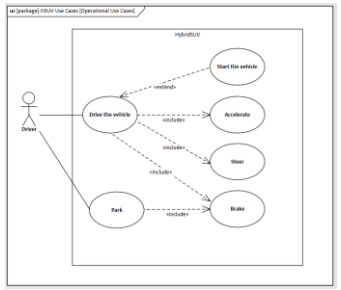
- All model elements, structure, and hierarchy
- SysML Diagrams - maintains layout
- Custom profiles
- Full logging of model transformation actions
- Batch mode

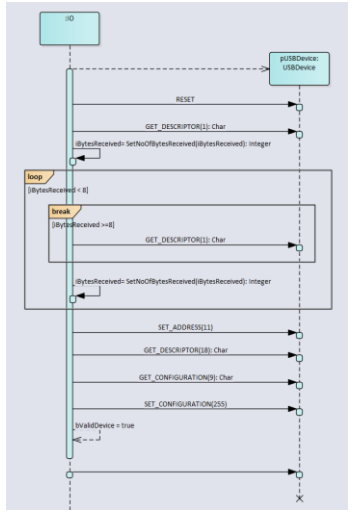


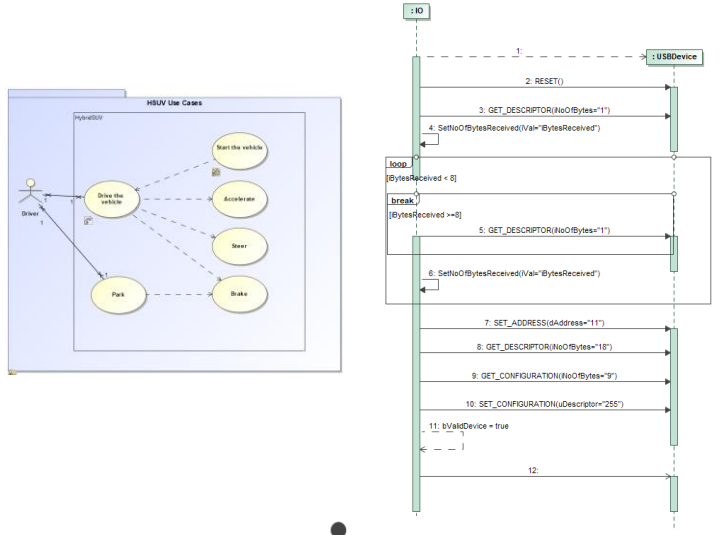
Enterprise Architect

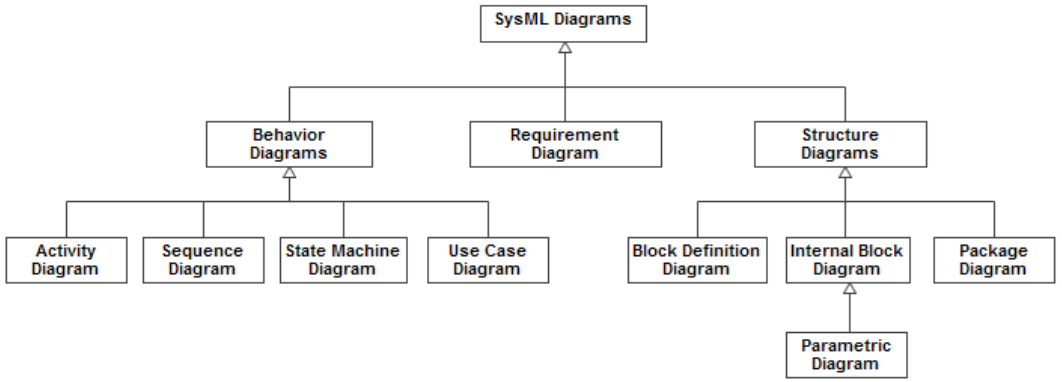


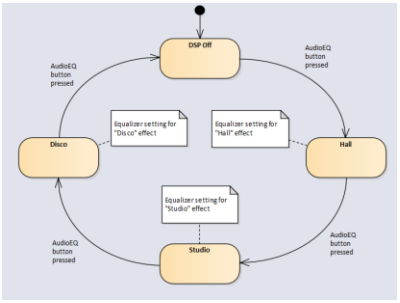
Cameo/MagicDraw

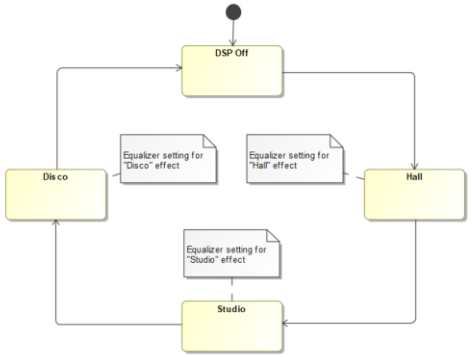












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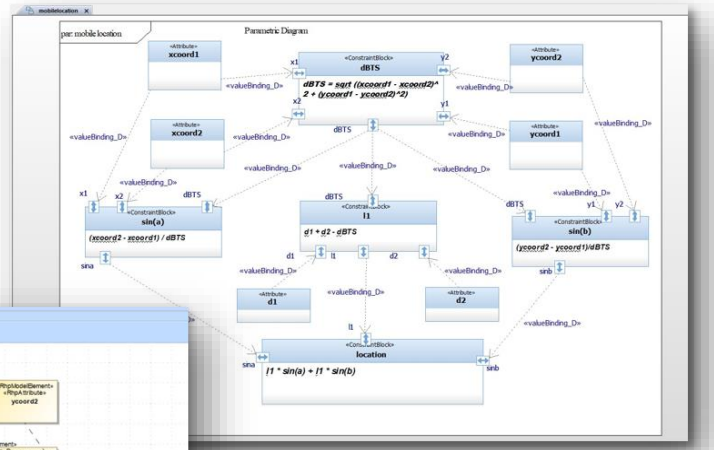
Full Model Conversion Between Tools

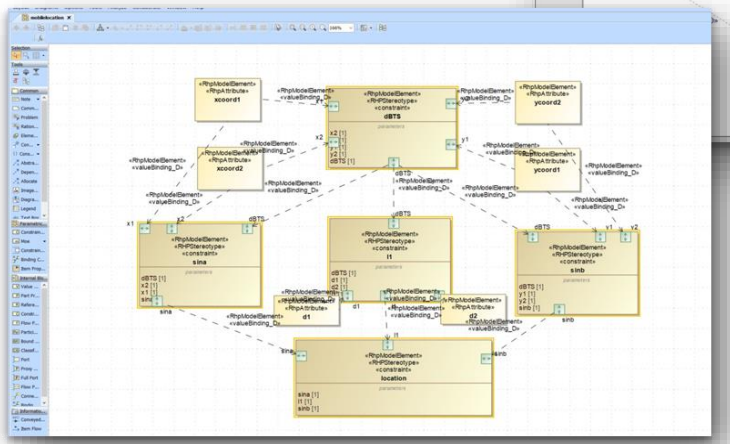
The Publisher converts SysML Structure Diagrams:

- Block Definition Diagrams
- Internal Block Diagrams
- Package Diagrams
- Parametric Diagrams

Rhapsody



MagicDraw



And SysML Behavior Diagrams:

- Activity Diagrams
- Sequence Diagrams
- State Machine Diagrams
- Use Case Diagrams

And Content Diagram and ‘Free’ Shapes (non-UML elements) Support

- A free « documentation » diagram of Cameo, used to create for example reading path across models

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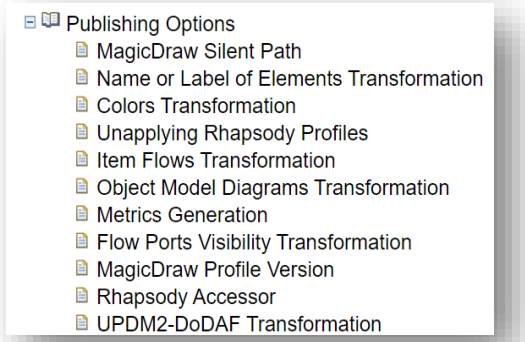
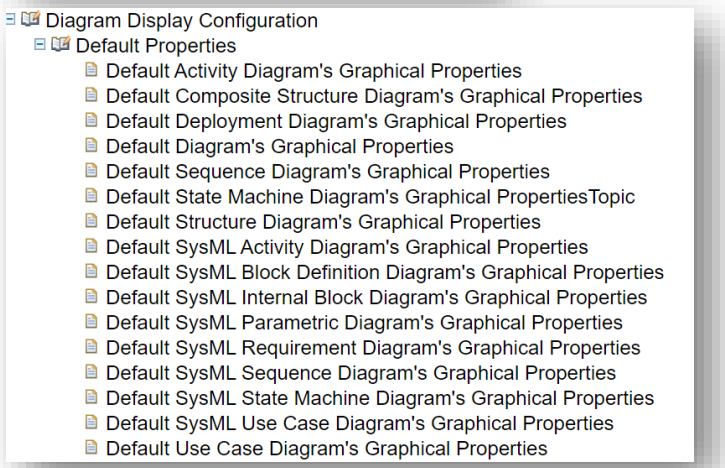
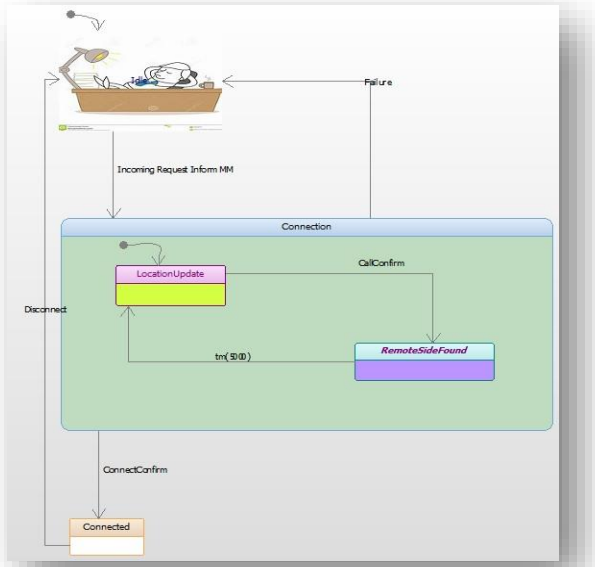
User Configurability

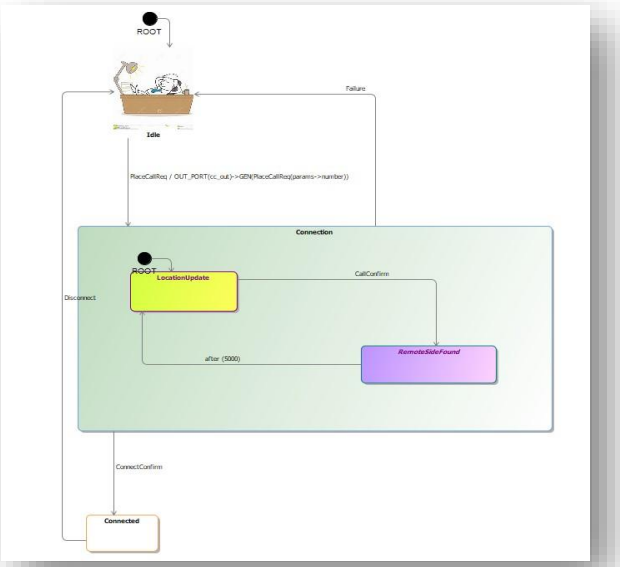
Customers have User Configuration

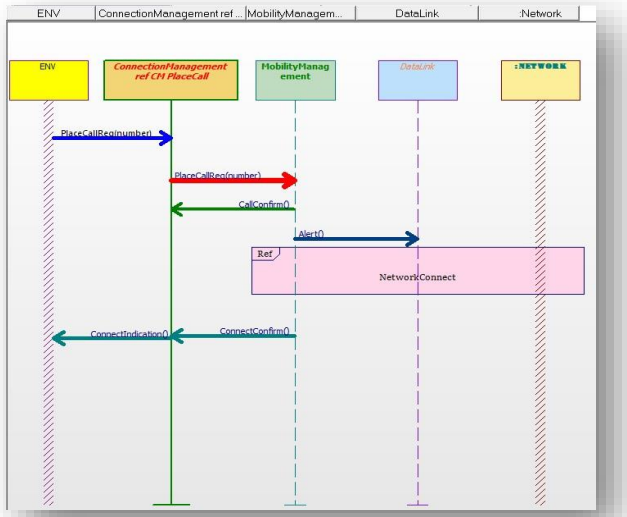
- The publisher provides two configuration files allowing different teams to control and consistently apply their defined methods and styling



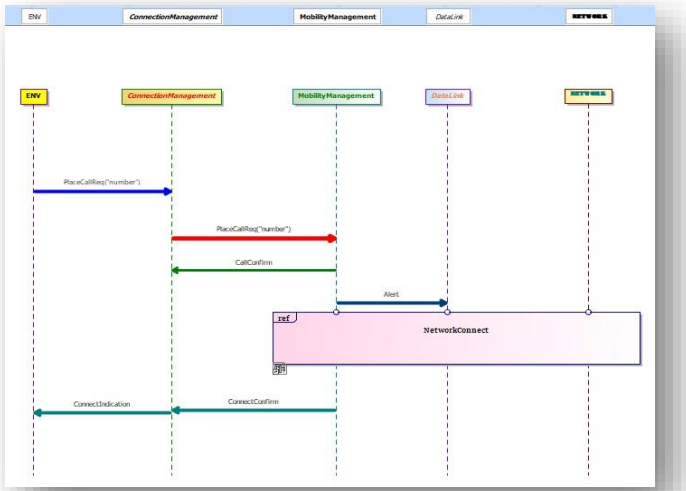








Rhapsody



MagicDraw

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Why not use XMI out-of-the-box, right?

- **XMI doesn't include diagram layouts**: This is where 90% of the modeling work is done. Diagrams provide a specific view in the specification and are laid out to communicate clearly and easily. Losing these is losing a lot of the intended communication of the author.

- **XMI doesn't map standard profiles across tool implementations**: Publisher maps the way SysML, for example, is implemented in the different tools so the resulting model looks like it was natively created in the target tool.

- **XMI doesn't handle different tool implementations of the UML or XMI standards**. Every tool supports UML differently and exports XMI differently. As the author of the Rhapsody XMI Toolkit, and after working with Cameo's XMI for 12 years, we know all the differences in how UML is supported, and the XMI is produced, so we can map the concepts consistently across implementations. Examples include Object containment and Authorized relationships that are different in Cameo and Rhapsody.

- **Over 40 person years of effort in Publisher family of products**.

Industry leaders trust Sodius to help them improve productivity

LOCKHEED MARTIN

BOEING

NORTHROP GRUMMAN

Raytheon

BAE SYSTEMS

AIRBUS

Dynetics
A Leidos Company

L3HARRIS™

SAIC

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Commercial Item Description (CID) for the Publisher from NAVAIR

Sodius Corp. is excited to announce that in April 2023, we received CUI from the U.S. NAVAL AIR SYSTEMS COMMAND HEADQUARTERS with a **Commercial Item Description (CID) for the Publisher for Rhapsody** per definitions (1)(i) and (1)(ii) of FAR 2.101 for a commercial product **that "enables single source of truth data for the MQ-25 Stingray MBSE program."**

Defense Contract Management Agency (DCMA) Commercial Item Group (CIG) stated that "**this CID will make it much easier for systems engineers to leverage the Publisher for Rhapsody on other DoD programs."**

SysML v2 Roadmap

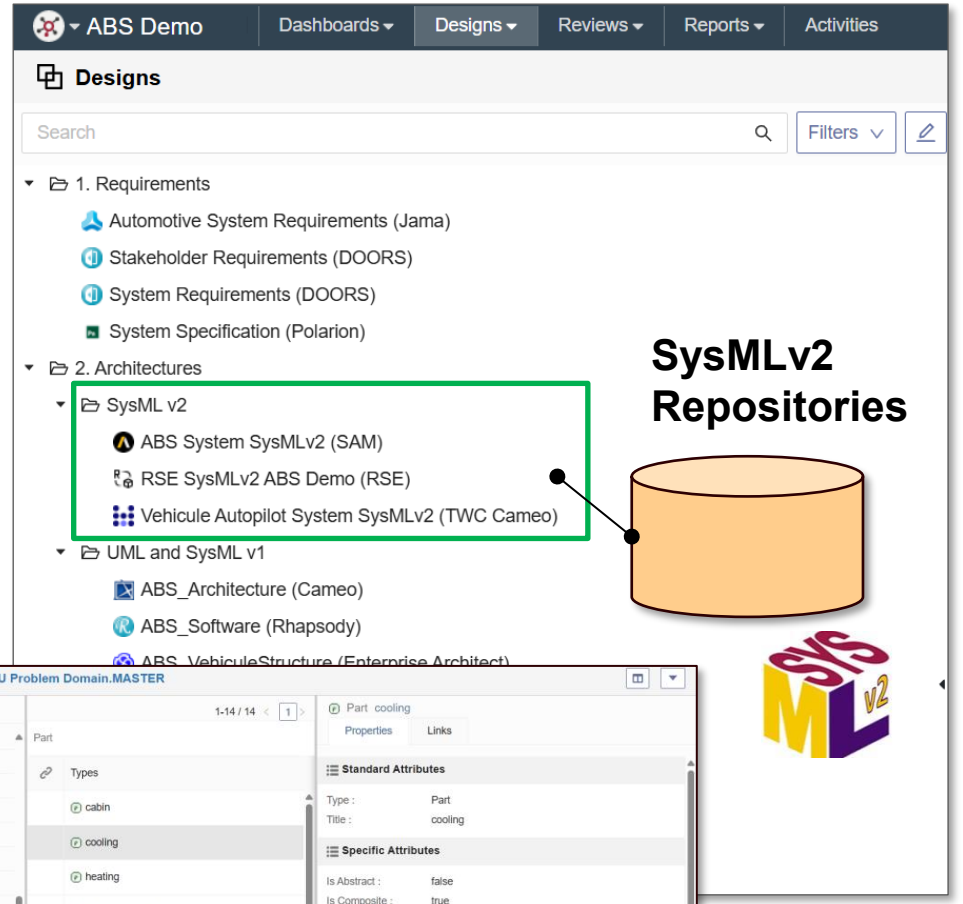
SysML v2 Roadmap

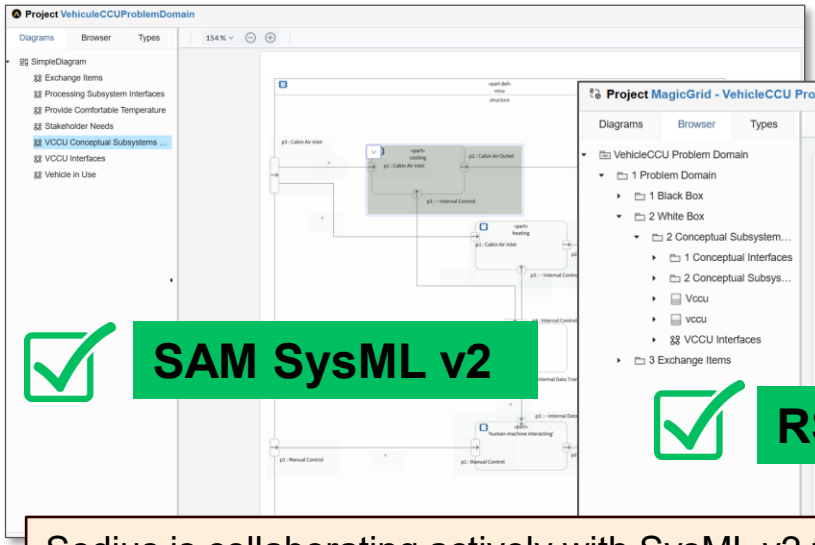
- **Model Transformation API to integrate SysML v2 models in various digital aggregation, exchange and synchronization scenarios, for exchanges between domains like architectures, requirements, tests or domain-specific integration**
- **SysML v2 Connectors and Digital Backbone Support with SECollab, our unified aggregation and review platform**

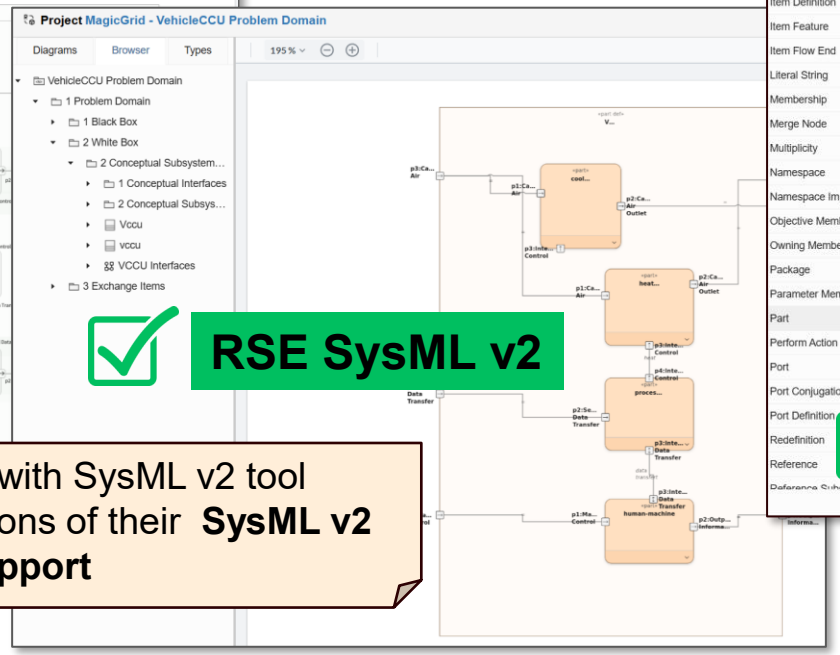
- **V2 to V1 bridging for specific engineering flows**
- **Code Generation and/or Simulation, interpreting and executing behaviors and constraints included in the standard to feed various code targets or interpreted engines**

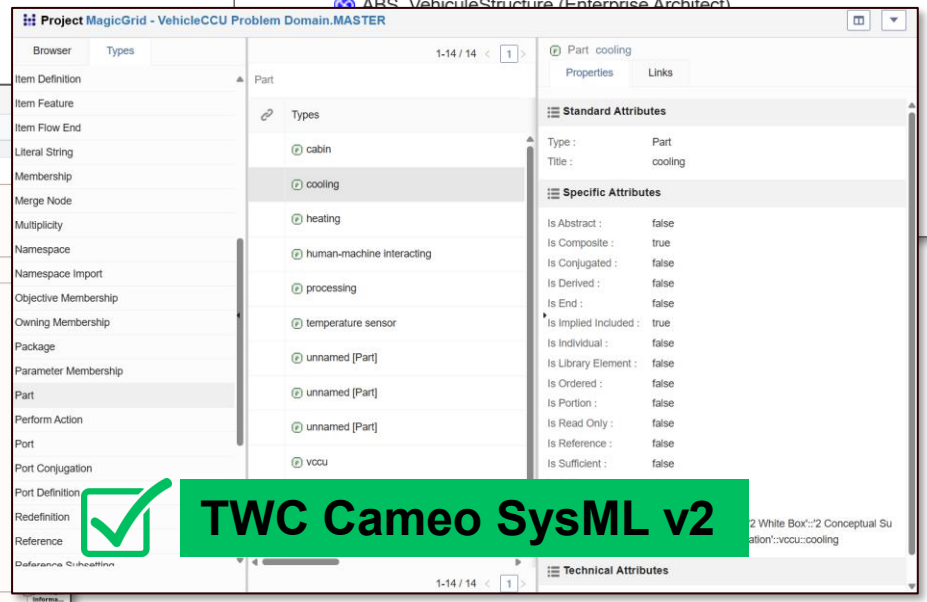
SysML v2 Integration

- **SysML v2 APIs are integrated in our connectors catalog** and as Publish agents in our SECollab aggregation platform (including diagram support)
  - Ansys System Architecture Modeler (SAM)
  - IBM RSE
  - Dassault Team WorkCloud Cameo SysMLv2









Sodius is collaborating actively with SysML v2 tool vendors to integrate latest versions of their **SysML v2 APIs and specific diagram support**

Licensing and Support

Licensing & Support

Licensing

- Program Based
- One-year Term or Perpetual licenses
- Floating and Node-locked
- Designed for use in both Secure and Non-secure Lab Environments
- Enterprise (unrestricted - available upon request)

Try before you buy

- Full software, with only a disclosure watermark on the diagrams
- No network connection necessary
- Adjust the many user configurable styling settings to your team's preferences
- See the actual exported model in Cameo or Rhapsody file formats
- Manipulate the new model accordingly

Technical Support

- Online Support 24/7 from our team of technical experts in the tools and their usages
- Online User Documentation
- Knowledge Base Articles
- Download Portals

The Value of the Publisher Products

- ✓ The ability to Export and Publish very large models *(successfully exchanged 12,000 diagrams and 900,000 elements)*
- ✓ No manual work or cleanup is needed by leveraging user-configurable settings and display styling
- ✓ Model checking is implemented to identify, log, and report inconsistencies in the source model with the potential to cause rework or cleanup in the target model *(maintains or improves model quality)*
- ✓ Extremely fast
- ✓ Models can be manually changed after publish and export
- ✓ Same form and function model, but in a different tool

Presented by:

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