

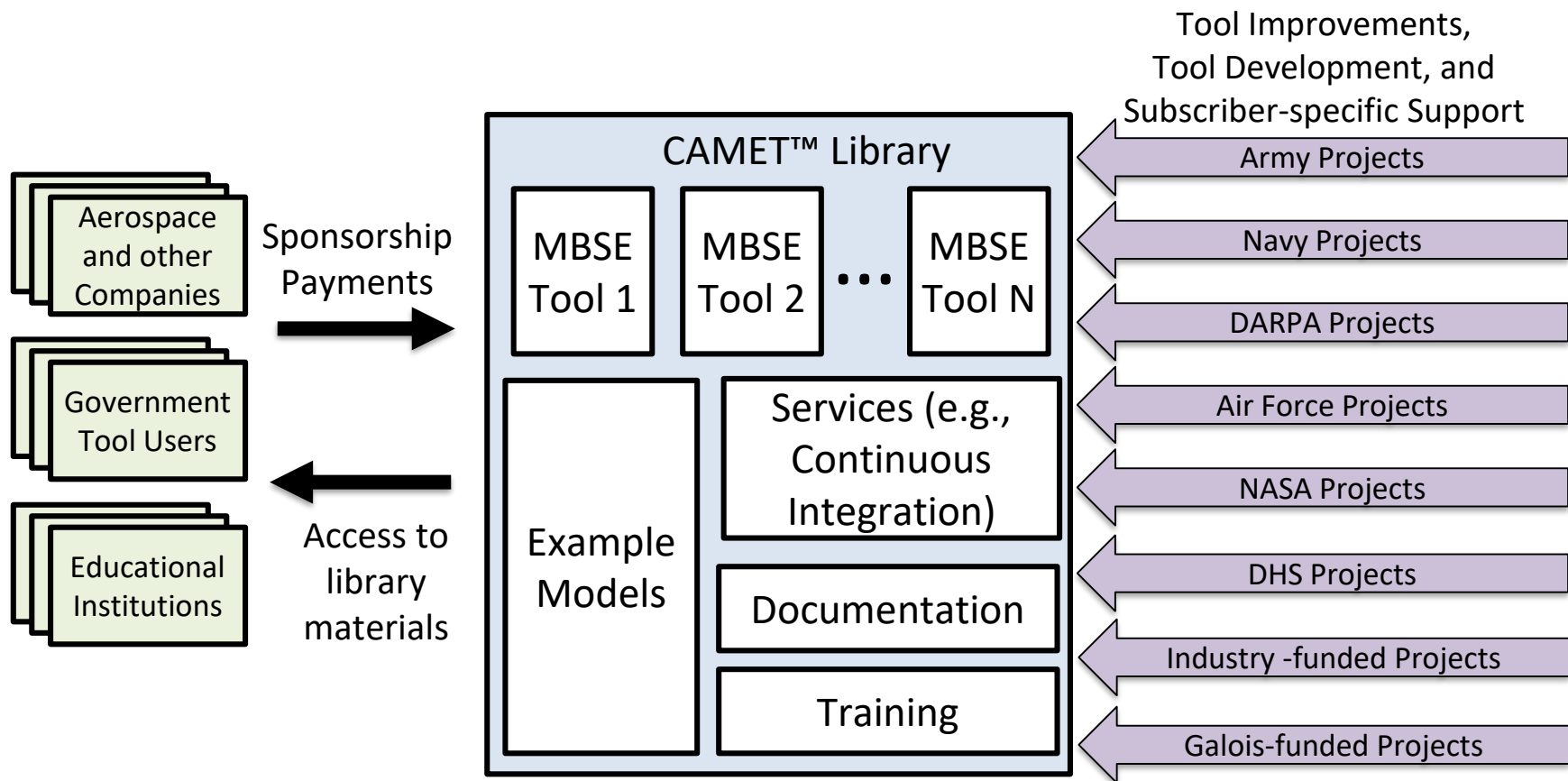
| galois |

CAMET AADL Tools

CAMET - Curated Access to Model-based Engineering Tools

- **A subscription library of Model Based Systems Engineering (MBSE) tools**
 - Annual fee: \$3000.00 subscriber and 12,000 – 18,000 Enterprise
 - US Government users (free use) include: Army, Air Force, Navy, NASA
 - Commercial users include a dozen major aerospace primes
 - Educational Institutions (free for course use)
- **Most work with the Architecture Analysis and Design Language (AADL)**
- **Running in the Open Source AADL Tool Environment (OSATE)**
- **Built on the Eclipse Integrated Development Environment (IDE)**
- **CAMET includes:**
 - Executable tools
 - Example models
 - Documentation
 - Video demonstrations

CAMET Library



- ✓ Subscribers get access to all tools.
- ✓ Perpetual license available to Government users.
- ✓ Enterprise support subscriptions available.
- ✓ Training classes available

CAMET AADL Tools

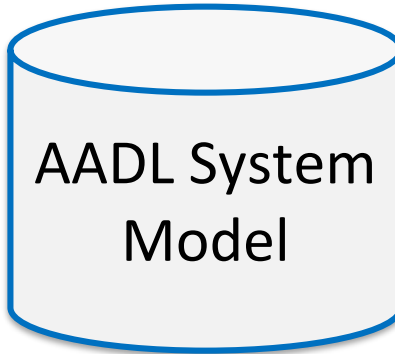
Can be leveraged w SysMLv1 and to be v2, plus OSATE tools

Security & Safety

- Separation
- Confidentiality
- Integrity
- Availability
- Risk analysis (STPA)

Resource Utilization

- Bus Bandwidth
- CPU Usage
- Memory Usage
- Custom properties



Translation

- SysML <-> AADL Bridge and Profiles
- SEDS Import and Export
- Open MBEE <-> AADL

Trade Space Analysis and Automation

- Design Space Investigator
- Continuous Virtual Integration
- Auto & Config Reports

Real-time Performance

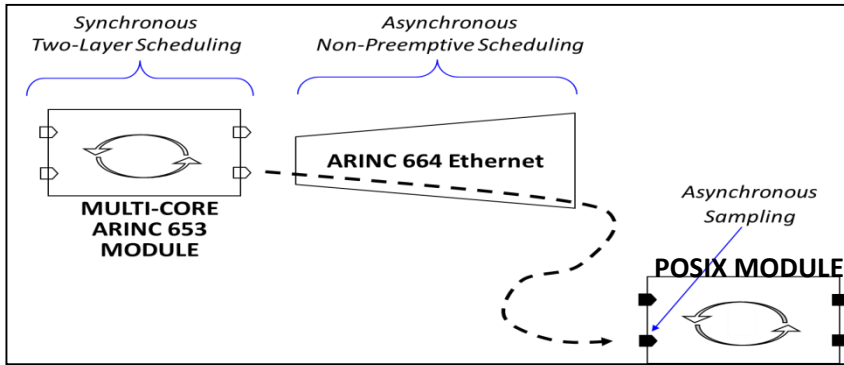
- Execution time/Deadline
- Deadlock/starvation
- Latency
- Schedulability

Systems Engineering

- Minimize system change effects
- System wide virtual analysis
- Behavior Analysis
- Code Generation and Verification

A common model + precise semantics supports a range of analysis tools

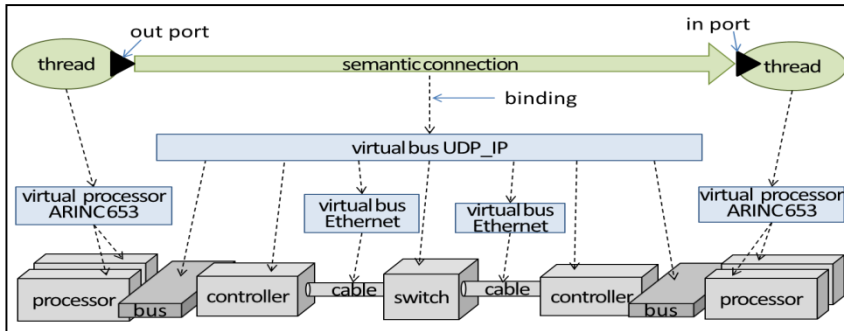
Framework for Analysis of Schedulability, Timing and Resources (FASTAR)



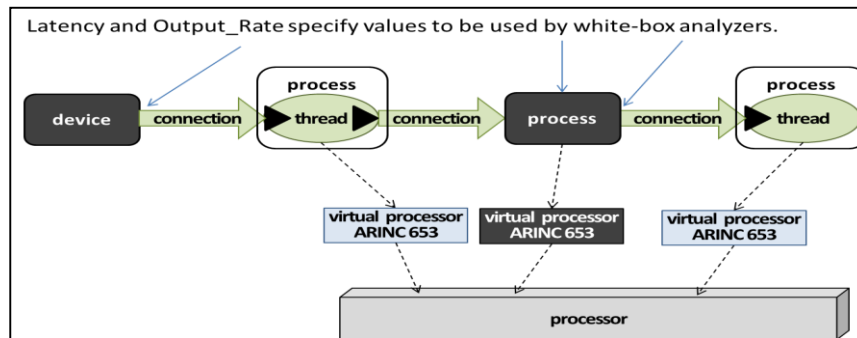
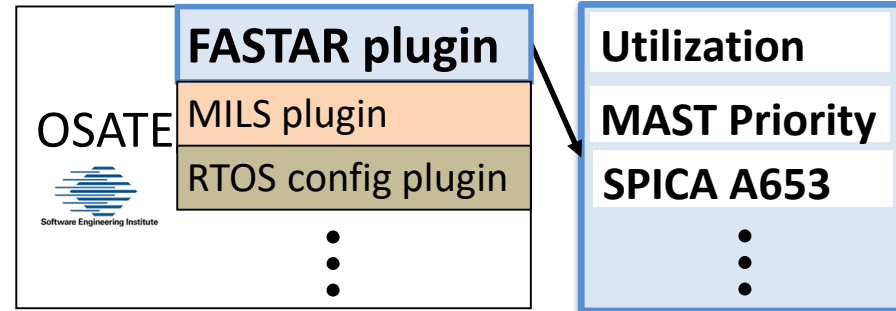
Heterogeneous Architectures

FASTAR analyzes resource needs and timing behaviors of complex, integrated system architecture models as they evolve through multiple development phases.

FASTAR can also generate A653 schedules.



Layered Architectures



Mixed Fidelity Models

Framework can be extended with other analyzers & schedule generators, e.g. MIL-STD-1553, multi-core.

Separation Analysis - Multiple Analyses for Domain Separation (MADS)

- Verify that information assigned to different domains is kept separate across connections, and memory and processor bindings unless handled by privileged components
- Data flows in a system are labeled with different domain tags and levels such as: security, integrity, availability, or others

Unintended cross domain information flows occur in many ways

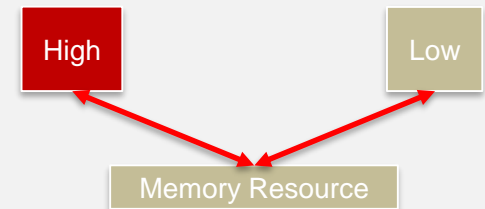
Explicit through system connections

Direct Connection

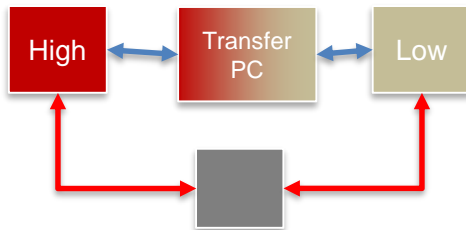


Implicit through system bindings

Shared Resource

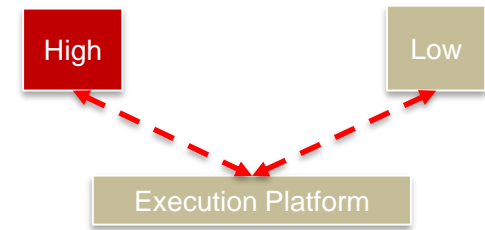


Indirect Connection



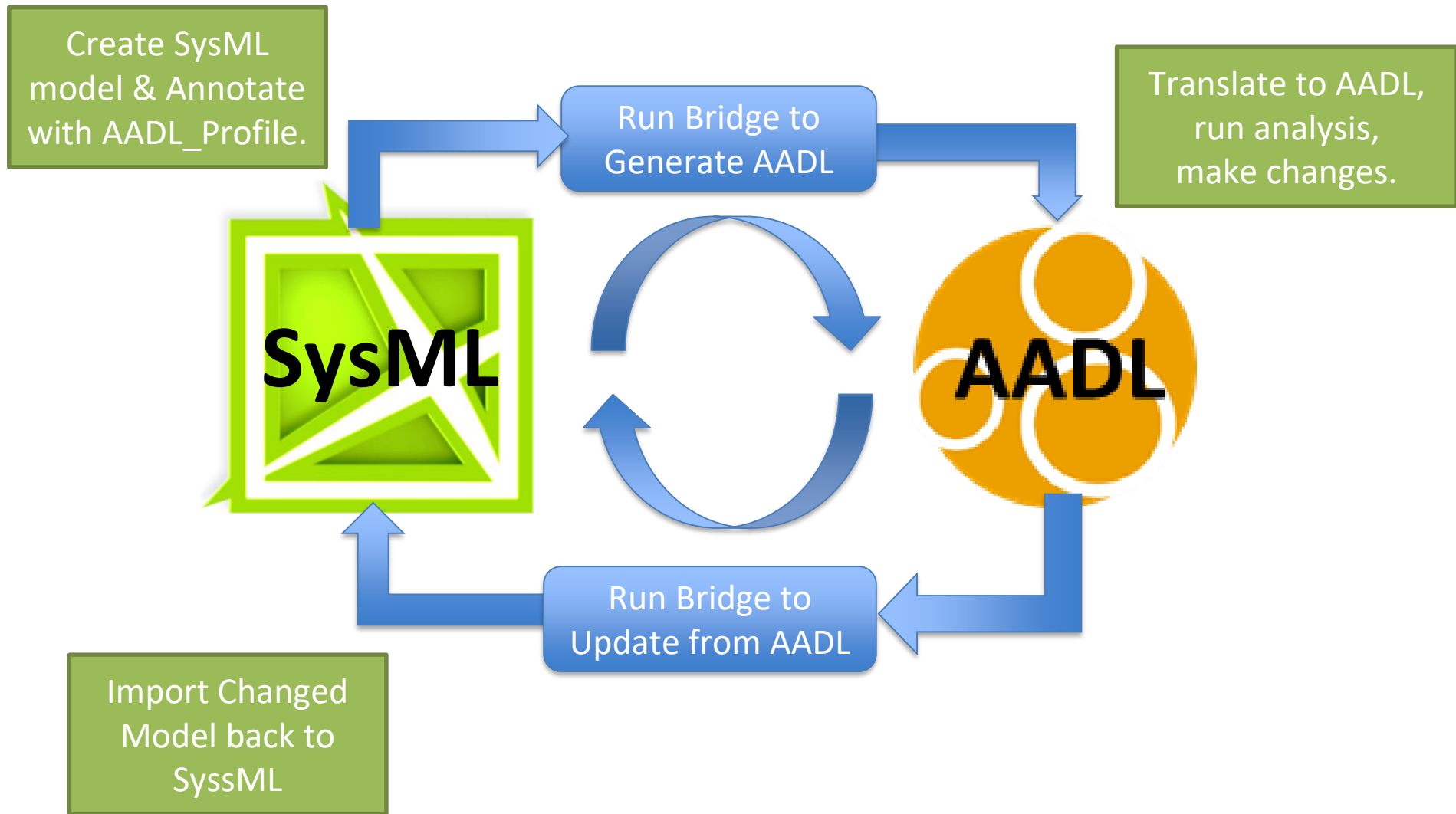
PC = Privileged Component

Common Binding



Reduces the risk that the system architecture includes cross domain information flows

SysML to AADL Bridge



CAMET Tool Acronyms

CAFFMAD	Continuous Architecture Framework for Fault Management Assessment And Design	MAILLE	Microkernel Application Information flow with Logic-based Enforcement
CVIT	Continuous Virtual Integration Toolkit	MILS	Multiple Independent Levels of Security
DAREIT	Design Analysis for Rapid, Effective Integration and Test	OSATE	SEI's Open Source AADL Tool Environment
DSE	Design Space Explorer	RBD	Reliability Block Diagram
FASTAR	Framework for Analysis of Schedulability, Timing and Resources	RMF	Risk Management Framework
GUMBO	Grand Unified Modeling of Behavioral Operators	RTOS	Real-Time Operating System Configuration
INDIGO	Insight to Diverse Info w Graphics and Ontologies	SAESM	Stakeholder Access to Embedded System Models (w SEDS data format)
ISOSCELES	Intrinsically Secure, Open, and Safe Cyber-physically Enabled, Life-critical Essential Services	SESSAF	Systems Engineering Safety and Security Analysis Framework
MADS	Multiple Analyses for Domain Separation	SLICED	State Linked Interface Compliance Engine for Data
MAUDE	Model Analysis Using Domain Expertise	SPICA	Separation Platform for Integrating Complex Avionics
		SysML2AADL	SysML to AADL Bridge Tool (bidirectional)
		TSE	Trade Space Explorer
		TUREC	Tooling to Understand Ripple Effect Costs

Blue indicates name of the CAMET analysis tool, they run in **OSATE**