Furness Toolset for the AADL

SAE AS2C

Tucson, Arizona

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Outline

- Background
- Features
- QA Activities
- Plans

Furness Toolset for the AADL *Background*

- Goals
  - Develop analysis tools for AADL
  - Present the tools so that they are attractive to practicing engineers
  - Spread the gospel
    - No more systems designed with Word, PowerPoint, Excel and a compiler

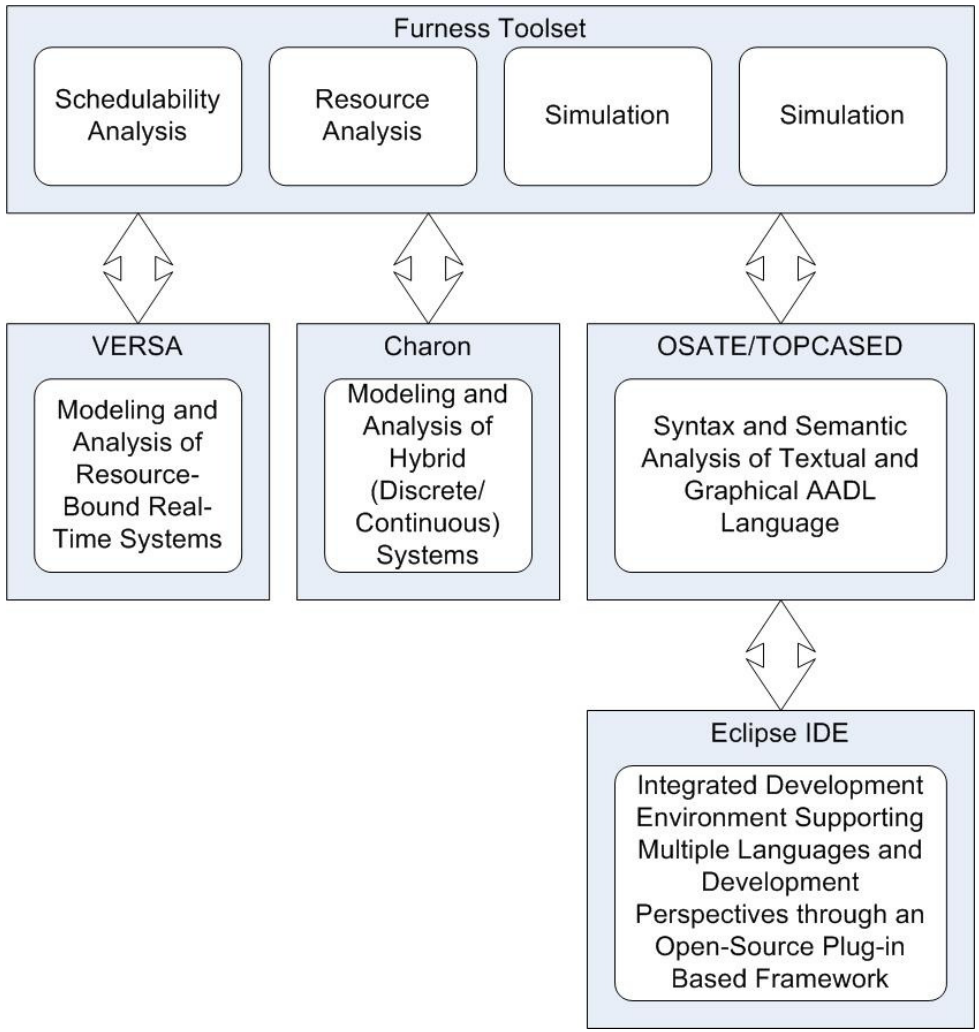
Furness Toolset for the AADL *Background*

- Development
  - Tools are a joint effort of Fremont Associates and Penn under an AFOSR STTR.
- Business Model
  - Give the stuff away
  - Sell support
    - Pays for traditional customer service roles
    - Pays for ongoing maintenance and enhancements

Furness Toolset for the AADL *Background*

- Focus Areas
  - Traditional embedded systems applications
    - Avionics, Automotive, robotic dogs
  - Plug-and-play Medical Devices
    - Emerging system-of-systems problem
    - Driven by demands of demanding (but naïve) users

Furness Toolset for the AADL *Features*



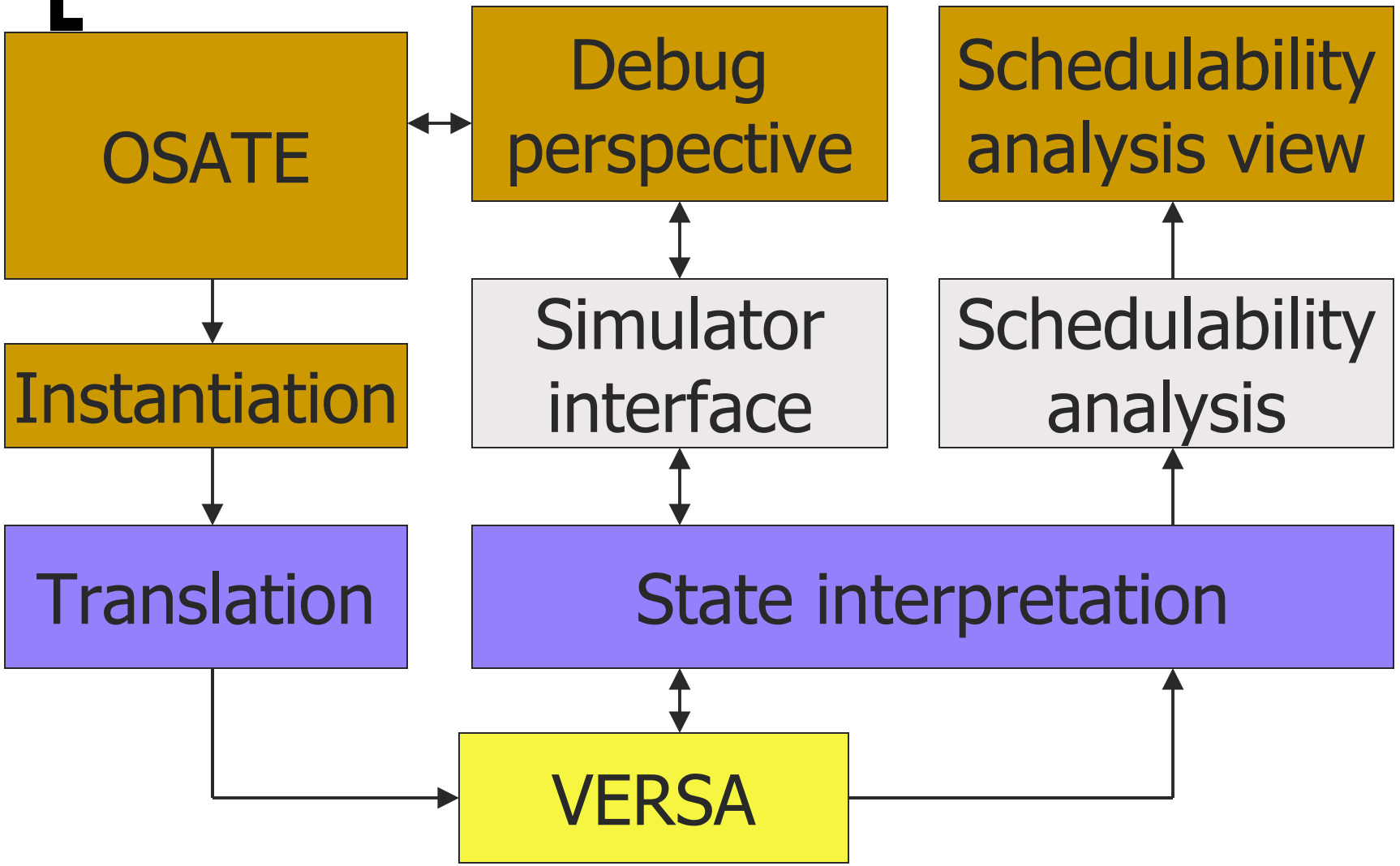
Furness Toolset for the AADL *Features*

- Furness Perspective
  - Eclipse perspective providing task-oriented interface for AADL tools
- Schedulability Analysis
  - Binary schedulable/unschedulable report
  - Best/Worst-Case Execution Time by Thread

Furness Toolset for the AADL *Features*

- Thread Simulation in the Eclipse Debugger
  - Interactive Simulation (single-step, run to breakpoint, *etc.*)
  - Manual or random non-determinism resolution
  - Graphical timing diagram view of simulation progress
  - Graphical view of resource utilization over time
  - Graphical view of thread states over time

Tool Architecture



Furness Toolset for the AADL *Features*

- New to Version 1.0.3
  - Event queues
  - Enhanced resource utilization view
  - Enhanced thread state view
  - QA Activities

Furness Toolset for the AADL
QA Activities

- Open Source
  - A few highly motivated souls create software enjoyed by the many
  - Implementation driven
  - Work products are
    - Feature rich
    - Quality unknown
- *The very definition of CMMI Level 1*

Furness Toolset for the AADL
QA Activities

- Open Source
  - Good:
    - Sharing of source
    - Rapid incorporation of new and novel features
  - Not so good:
    - Lack of mature development process
    - Lack of critical artifacts (requirements, V&V artifacts, *etc.*)
- What to do for tools intended for domains controlled by FAA (DO-178B), FDA, *etc.?*
  - Question is not unique to the Furness Toolset. TOPCASED has formed a QA group to address the same issues.

Furness Toolset for the AADL
QA Activities

- Fremont Associates Strategy:
  - CMMI Level 3 by year-end 2007
  - Develop requirements
    - SAE Standard document
    - User Input
  - Enhanced Validation Activities
    - Requirements-based testing
    - Reporting of source code coverage

Furness Toolset for the AADL
QA Activities

- Current
  - Defining, implementing and executing key CMMI process areas
    - Requirements Management
    - Technical Solutions
    - Verification
    - Validation
    - *Etc.*
  - Acquiring needed tools
    - Telelogic DOORS (requirements management)
    - Rational Functional Tester (record/playback automated test tool)
    - Rational Pure Coverage (source code coverage metrics)

Furness Toolset for the AADL *Plans*

- Functional Enhancements
  - Oleg
  - Can
  - Fill
  - These
  - In
- QA Activities
  - Continued participation in TOPCASED QA group
  - Extract formal requirements from SAE Standard
  - Achieve full test coverage of requirements
  - Achieve decision coverage of source code

Furness Toolset for the AADL

- Questions? Comments?
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