Carnegie Mellon
Software Engineering Institute

Fact Sheet

SAE Architecture Analysis & Design Language (AADL)

What it is

The SAE AADL is a new international standard for predictable model-based engineering of real-time and embedded computer systems.

Intended fields of application are automotive systems, avionics and space applications, engine and power-train control systems, medical devices, and industrial process control equipment.

The SAE AADL international standard consists of

- a textual and graphical language for modeling the architecture of embedded software systems and their target platforms
- precisely defined execution semantics that support 1) the analysis of operational properties such as timing, reliability, safety criticality, and 2) the generation of model-compliant runtime systems
- a common architecture modeling notation to leverage architecture models across projects
- an XML/XMI interchange format to support AADL model delivery between contractors and interoperability with commercial and in-house tools
- UML 1.4 and UML 2.0 profiles that add real-time and embedded systems semantics of AADL to UML

For more information about AADL and its use, please go to www.aadl.info.

What AADL can do

- Represent embedded applications as component-based system architectures
- Model task and communication architectures with precise execution and communication timing
- Model component interactions as flows, service calls, and shared access
- Model the binding of the application to its excution platforms
- Support a range of scheduling protocols and resource allocation schemes
- Represent modal and configurable systems
- Support component evolution and large-scale development
- Accommodate new analyses through extension by properties and introduction of sublanguage annexes

---

Who will benefit

- Software systems engineers responsible for architecting and integrating embedded and real-time software systems
- Program managers responsible for successful development and maintenance of large-scale performance-critical systems
- Commercial tool vendors interested in providing design, analysis, and generation solutions to the embedded computing systems community
- Researchers in academia, industry, and government looking for an architecture research platform with a direct link to the practitioner community

---

Tool support strategy

Commercial support

- Extend existing modeling tools with AADL import/export (TNI)
- Extend UML toolset based on UML profile
- Interface existing analysis tools via XML interchange format and native filters
- Interoperate with other commercial tools via XML

Open Source AADL Tool Environment (OSATE)

- Eclipse-based full AADL front-end with XML support
- No-cost common public license (CPL)
- Analysis and generation extensions via plug-ins
- Low-entry-cost platform for in-house prototyping and research
- Jumpstart for STTR, SBIR, and commercial tool projects

Who is involved in the AS-2C (AADL) Subcommittee

Bruce Lewis (US Army AMRDEC): Chair of subcommittee

Peter Feiler (SEI): technical lead, author & editor of AADL standard, XML/XMI Interchange Format

Steve Vestal (Honeywell): author of AADL Standard, Error Model Annex

Ed Colbert (USC): author of UML Profile of AADL

Joyce Tokar (Pyrrhus Software): author of Ada & C Implementation Annex

Other Voting Members and Users

Boeing, Rockwell, Lockheed Martin, Raytheon, Smith Industries, General Dynamics, Airbus, Axlog, European Space Agency, TNI Europe, Dassault, EADS, High Integrity Solutions

Coordination with

NATO Aviation, NATO Plug and Play, French Government COTRE, SAE AS-1 Weapons Plug and Play, OMG UML & SysML

What is next for the AADL Standard:

- A standard error model annex to support fault and reliability modeling
- A standard partitioning and layering annex to support partitioned and reference architectures
- A standard behavior and contract annex to support behavior validation

Who is using AADL

Honeywell, Rockwell Collins, General Dynamics, Airbus, European Space Agency, TNI Europe, EADS, U. Pennsylvania, Embry-Riddle Aeronautical U., MIT, Clemson U., USC

More Information

For more information on the SAE AS-2C (AADL) Subcommittee, contact:
Bruce Lewis, US Army AMRDEC, Huntsville, 256-876-3224

bruce.a.lewis@us.army.mil

For more information about the SAE AADL Standard and the Open Source AADL Tool Environment:

www.aadl.info

To purchase the SAE AADL Standard (SAE AS-5506):
1-877-606-7323 (USA &Canada)
1-724-776-4970

store.sae.org

customerservice@sae.org