Modeling CCM with AADL

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AADL meeting
2007-04-16/19
Context

- Aim: Developing CCM component based systems with AADL
- Use of LightweightCCM
- Other constraints:
  - compatibility with other AADL tools
  - compatibility of non-CCM developments
Reference example

Component1

... operation() {
... Server_Host_facet->operation1(the_array);
... }
...

Component2

... operation1() {
... }
...

Client(…){
... ClientHost_facet->operation();
... }
...

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Development process (draft)

Manual generation
Automatic generation

interface view
.data view
.concurrency view

Interface
Implementation
Generated runtime
Complete runtime
Simple platform
Complete platform

Interface
Abstract component
Concrete component
Generated runtime
Complete runtime
Simple platform
Complete platform

.idl
.idl3
.cdp

Abstract component
Concrete component
Generated runtime
Complete runtime
Simple platform
Complete platform

Development process (draft)

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Spices defines four views (inspired from Assert)

- **Interface view**
  - abstract systems representing the components
  - data accesses represent facets and receptacles
  - used to define and check the composition
  - never instanciated but transformed into other AADL components in the concurrency view

- **Data view**
  - part of the final AADL model
  - represents the data types
Spices views (2/2)

- Concurrency view
  - part of the final AADL model
  - represents the runtime elements implementing the components

- Deployment view
  - part of the final AADL model
  - represents the execution platform and other elements of the final system
Continuation

- Improvement of the development process
  - Enter into details of the representation
  - Raise current problems with the language
  - Contribute to AADL v2.0
- Prototyping of automatic generation
  - Prototype tools to perform the automatic transformation of CCM models into AADL
Spices takes advantage of AADL v2.0:
- Improved provides/requires data access
- New provides/requires subprogram access
- Propositions to slightly extend these mechanisms (e.g., data access connections between subprogram features)
- Spices and its tools are based on OSATE
  - => Need for a support of these constructs by OSATE as soon as possible