

AADLv2: an Architecture Description Language for the Analysis and Generation of Embedded Systems

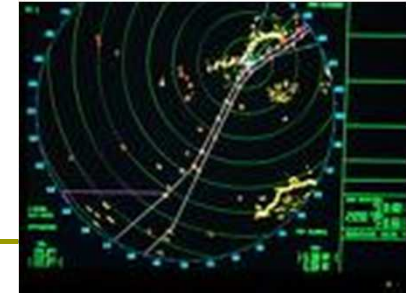
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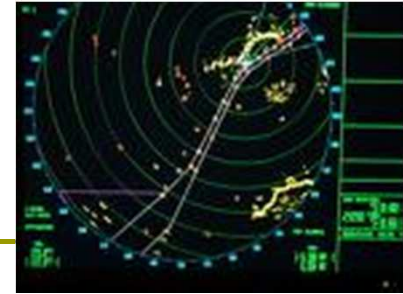


Introduction



- Goal: to model a simple radar system
- Let us suppose we have the following requirements
 1. System implementation **is composed by physical devices** (Hardware entity): antenna + processor + memory + bus
 2. and **software entity : running processes and threads** + operating system functionalities (scheduling) implemented in the processor that represent a part of execution platform and physical devices in the same time.
 3. The **main process is responsible for signals processing** : general pattern: **transmitter -> antenna -> receiver -> analyzer -> display**
 4. **Analyzer is a periodic thread** that compares transmitted and received signals to perform detection, localization and identification.
 5. [..]

Introduction



□ Issues

- How to model a system that conforms to requirements
- How to validate the solution ?
- How to prototype it ?
- How to go further, down to the implementation ?

□ Solution, one among others

- Use an architecture description language:
 - to model the system
 - to run various verification
 - and actually, to automatically produce the system

Outline

Goal: introduce model-based analysis of embedded systems using the AADLv2 Architecture Description Language

□ **Part 1: Introduction to AADLv2 core (about 60')**

- Syntax, semantics of the language

□ **Part 2: introducing a case study (about 30')**

- A radar illustrative case study

□ **Part 3: Scheduling analysis (about 60')**

- Introducing real-time scheduling theory and its use with AADL

□ **Part 4 : code generation (about 60')**

- How to generate code from an AADL model and how to run it