

JAVA™ IN EMBEDDED AND REAL-TIME SYSTEMS

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Context : Trialog was the technical leader of the European R&D project called AJACS (Applying Java to Automotive Control Systems), with the following partners : PSA, Fiat, Delphi and University of Karlsruhe. This seminar presents the return of experience on the usage of Java in embedded and real-time systems, as analyzed by Trialog along the project.

Seminar goals

- Present the context of creating Java applications in embedded systems, with examples taken from automotive applications.
- Give guidelines for a thought concerning the definition of a high integrity profile for Java, and corresponding tools, in order to allow its integration in embedded and real-time systems.
- This seminar is intended for embedded systems development teams which have to integrate code written in Java, and more specially people having a first experience with Java.
- This seminar intends to transmit Trialog analysis on
 - process of integrating Java applications in embedded and real-time systems
 - criteria for choosing a Java technical solution that fits requirements of a given application
 - typical problems encountered by embedded systems programmers while moving to Java
 - typical problems encountered by Java programmers while writing embedded software

Seminar agenda

(Duration: 1 day)

- 1 Introduction on embedded systems
 - General characteristics
 - The case of automotive applications
- 2 Programming languages for embedded systems
 - The C language
 - Object Oriented Languages
 - The case of Java
 - Java and real-time
 - Think tanks on standardisation
 - Requirements
- 3 Development of Java applications
 - Development environment
 - System Programming
- 4 Support of real-time applications
 - Multithreading
 - Synchronisation
- 5 Support of exceptions
 - Software engineering
 - Real-time behaviour
- 6 Initialization Model
 - Usual Java model
 - Common practice in embedded systems
- 7 Memory Management
 - Garbage Collection
 - Usage of objects
 - Dynamic downloading
 - Static applications : ROM/RAM partitioning
- 8 Java / Native Interface
 - General features
 - Recommendations for usage in embedded systems

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