Information Society Technologies

ARTIST2 - Progress Review

Grenoble, October 3-4th, 2005

Cluster:

Hard Real-Time (HRT)

Action leaders :

Albert Benveniste (INRIA)

Alberto Sangiovanni-Vincentelli (PARADES)

Outline of the Presentation

- **HRT overview**
  - what we did not do
  - what we did
- **JPRA on Semantic Platform**
- **JPRA on Merging ET and TT Modes of Execution**
- **JPRA on On-Board Diagnosis**
- **What next**

HRT Overview

we are sorry that we did not do what was expected and did what was not expected

❖ What we did not do

- Platforms

❖ What we did

- DECOS/ARTIST2 Summer school on « Architectural Paradigms for Dependable Embedded Systems » (September 12-16) with participants from both academia and industry (e.g. Honeywell, Airbus, Philips, Volkswagen, BMW, Toyota, Alcatel,...).
- Integration: joint papers
- Integration: inviting affiliates
- Inviting industrials
- Scientific exchanges and forums
- Scientific exchanges and forums
- Scientific exchanges and forums

HRT Overview

we are sorry that we did not do what was expected and did what was not expected

- **What we did a lot**
  - Filling time sheets
  - Filling time sheets
  - Insisting that colleagues fill time sheets
  - Micro-Reporting
- **A gentle request to the evaluators**
  - Many of us feel that we have done too much *micro-reporting,* i.e., reporting on too many items having as only purpose to fill Excel sheets.
  - We believe that well done reporting could be welcomed by our community as useful info (we learn what's happening elsewhere in communities of which we usually don't attend conferences); is it possible that we move to different style of reporting?

HRT Overview: integration

Selected Joint publications

❖ JPRA on Semantic Platform: INRIA+Verimag+PARADES

- A. Benveniste, L. Carloni, P. Caspi, A. Sangiovanni-Vincentelli. *Heterogeneous Reactive Systems Modeling and Correct-by-Construction Deployment*. Proc. of EMSOFT'2003, R. Alur and I. Lee Eds., Oct. 2003.
- A. Benveniste, B. Caillaud, L. Carloni, P. Caspi, A. Sangiovanni-Vincentelli. *Heterogeneous Reactive Systems Modeling: Capturing Causality and the Correctness of Loosely Time-Triggered Architectures (LTTA).* Proc. of EMSOFT'2004, G. Buttazzo and S. Edwards, Eds., Sept. 27-29, 2004.
- A. Benveniste, B. Caillaud, L. Carloni, A. Sangiovanni-Vincentelli. *Tag machines.* In Proceedings of EMSOFT'05, Sept. 2005.

HRT Overview: integration

Inviting affiliates

- **JPRA on Merging ET & TT**
  - *Industrials: BMW, GM*
  - *TU München, Poli Torino*
- **JPRA on Diagnosis**
  - *DECOS partners: TTTech, Uni Firenze, TU Darmstadt, Humboldt Uni Berlin*

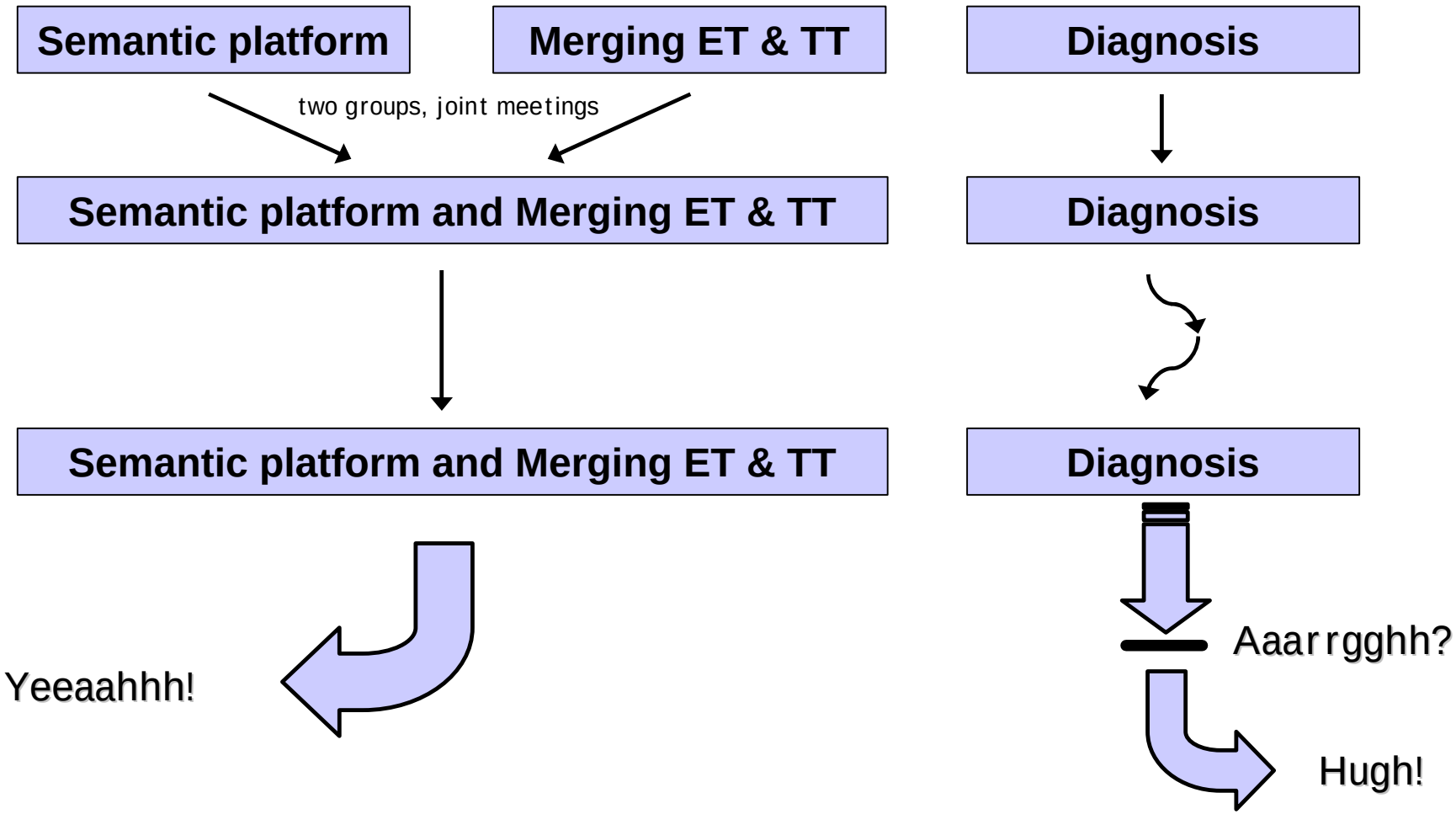
HRT Overview

Scientific exchanges and forums

- **With affiliates**
  - Mostly easy
  - Sometimes very problematic (funding issue)
- **With industrials (not always)**
- **Carefully prepared with well stated objectives**
- **High quality presentations, often long and tutorial**
- **In-depth discussions, recorded in…**
- **Detailed minutes, seen as a scientific tool, not just as proof of existence of the meeting**
- **Having real impact on ongoing research**

HRT Overview

A hectic family story



What next?

❖ **Diagnosis: overall very successful**

- Has been scientifically surprisingly interesting; however, very unfortunately,

  The 3 affiliates left ARTIST2 (dispute on funding)

  Personnel changes at TUVI

- Consequence: the diagnosis group was running two activities

  Statistical techniques for on-line diagnosis: left with only 1 team participating, namely the control team at INRIA (Zhang, Benveniste) → death, alas…

  Diagnosis and automata: actors still on-board and actively participating (Tripakis at Verimag, Ferrari at PARADES, and possibly Marchand at INRIA) → we propose to move this activity to the JPRA on Semantic Platform, in the framework of the new cluster being discussed next

What next?

- **Semantic platform and Merging ET & TT**
  - Has been very active
  - Had real impact on research subjects for several teams
  - The Rennes meeting showed convergence of the focuses of the HRT and Component clusters, namely:

    Pervasiveness of components in Hard Real-Time architectures, impact on architectures, design flow, and scheduling policies

    Importance of real-time and non-functional aspects in the concerns of the components cluster

- **It is therefore proposed that the two clusters fuse to form the new**

Cluster on
Real-Time Components

- **Systems, Architectures, Components**
- **Models for design (style + semantics + semantics + semantics)**
  - Viewpoints, functional & non-functional
  - Heterogeneity: glue & adaptors
  - Design space exploration and platform based design
  - Still ET & TT
  - New services for V&V and Synthesis
- **Continue with standards**

Cluster on
Real-Time Components

- **<u>Forums with specific industrial sectors</u> (1 per year)**
  - What the problems are, what the degrees of freedom are
  - Automobile (Autosar)? Aeronautics (Integrated Modular Avionics)?...
  - Have somebody deeply explaining issues, prepared jointly between some ARTIST guy and industrialist(s)
  - Each one of us would try to relate what we are doing to the above presentation, on-line and during a 2-3 days meeting
- **Technical meetings, where selected topics are more deeply discussed (1 per year)**
  - Because conferences and workshops fail delivering this service

Cluster on
Real-Time Components

- **Albert Benveniste leader**
- **JPRA's**
  - Diagnosis shifts to Verification & Testing cluster
  - JPRA on merging ET with TT – Paul Caspi
  - JPRA on Semantic Platform & Heterogeneity – Albert Benveniste & Alberto Sangiovanni-Vincentelli
  - JPRA on Interfaces – Bengt Jonsson
- **Standards (OMG) Sébastien Gérard**
- **Platform (Tool interchange) – Suzanne Graf**