Title/Venue to update wrt. event

INTERVAL Project 11557

Consortium

Industrial Applications

Objectives

Interest Group

Technical Approach

Project Workplan

Technology and Tools

Results & Benefits

Consortium Key Data

- **INTERVAL**
  - **Formal Design, Validation and Testing of Real-Time Telecommunications Systems**
- **Consortium**
  - **3 end users:** ERICSSON france telecom teletel TELECOMS TECHNOLOGY

  - **2 tool vendors:** Telelogic SOLINET Solutions for Innovative Networks!

  - **2 technology providers:** Institute for Telematics VERIMAG

- **Efforts** **232 MxM**
- **Duration** **03/2000-03/2002**

Objectives

- **Prototype a toolset for real-time systems development based on**
  - **SDL 2000 (norm ITU Z.100) extended with time**
  - **MSC 2000 (norm ITU Z.120) extended with time**
  - **TTCN ed.3 (norm ETSI 9646-3) extended with time**
- **Set-up an Interest Group August 2000**
  - **Requirements and drafting of timed extensions**
- **Submit timed extensions to ITU-T and ETSI March 2001**
- **Demonstrate toolset prototypes September 2001**
  - **New module for validation of real-time constraints**
  - **New module for generation of timed test cases**

Innovation

- **Enhance formal specification languages SDL, MSC, TTCN to describe and process timed constraints**
  - **at specification, verification, and testing phases**

- **Automate the generation of timed test cases**
  - **from formal system specification**

- **Provide expert guidelines to end users**
  - **for accurate use of the timed extensions in industrial projects**

- **Deliver an integrated tool chain for real-time systems**
  - **for an efficient and reproducible engineering process**

Technical Approach

- **Collect and analyse user requirements on real-time extensions for SDL, MSC and TTCN**

- **Use results from other R&D projects**
  - **French Proust project defining a semantics for timed SDL**
  - **SAM 2000 workshop on SDL and MSC**

- **Extend the semantics of the 3 notations for handling timed characteristics**

- **Adapt tools for the verification and testing of timed specifications**

- **Validate the new techniques in industrial applications**

Technology and Tools

- **Based on standard specification languages**
  - **SDL**, **MSC**, **TTCN** **widely accepted in the Telecom industry**

- **Theoretical background**
  - **Specification and verification of timed models**
  - **Conformance testing of distributed applications**

- **Commercial tools**
  - **TELELOGIC: TAU SDL Suite, TAU TTCN Suite, ObjectGEODE**
  - **SOLINET: CONTESSA Tools**

- **Academic technology**
  - **VERIMAG: Timed automata theory and prototypes**
  - **ITM Lübeck: Test generation theory and prototypes**

Industrial Applications

- **RMTP2 application (reliable multicast protocol)**
  - **experimented by France Telecom R&D**
  - **strong timing constraints**
  - **demonstrate protocol reliability and performance**
  - **validate timed extensions for SDL and TTCN**

- **MTP-2 application (layer 2 of the SS7 network)**
  - **experimented by TELETEL**
  - **critical timer values**
  - **develop extended SDL and TTCN models**
  - **run TTCN test cases against SDL specification**

Interest Group

- **Practitioners having strong needs and/or experience in real-time systems development**
  - **end users, tool vendors, standard bodies, FDT experts**
  - **Telecom domain, also Avionics and Space domains**

- **Contributions through**
  - **expressing their requirements**
  - **participating to the definition of appropriate timed extensions**
  - **supporting and accelerating the standardisation process**

- **Regular contact/meetings with project members**
  - **for requirements capture**   **August 2000**
  - **for drafting timed extensions**   **10/2000, 03/2001**
  - **for transfer to standardisation**   **11/2001, onwards**

Project Workplan

Workpackage 1   03/2000-06/2001

- **1.1 Requirements analysis**
- **1.2 Specification of timed extensions**

Workpackage 2   07/2000-01/2002

- **2.1 Prototyping/extending tools to support timed extensions**
- **2.2 Production of method guide**

Workpackage 3   09/2000-03/2002

- **3.1 Preparation of validation experiments**
- **3.2 Validation using tools prototypes**

Workpackage 4   03/2000-03/2002

- **4.1 Marketing the technology**
- **4.2 Transfer to standardisation**

Results

| **Major results**

- – **Support for timed constraints in SDL, MSC and TTCN notations**
- – **Higher continuity and stability of notations within standardisation bodies**
- – **Efficient and integrated tool support for real-time systems**

| **Technological advances**

- – **Earlier consideration of timing and performance constraints**
- – **Bridge the gap between functional and non-functional specification**
- – **Automate verification and generation tasks from formal system specification**

Benefits

- **Benefits for users**
  - **Improve their system development process with powerful model verification and testing capability**
  - **Narrow the gap between specification languages and testing languages**
  - **Reduce time-to-market, development and maintenance costs**

- **Benefits for suppliers**
  - **Enhance their existing product lines and develop new products for real-time systems development**
  - **Provide stronger support to Telecom software designers**
  - **Extend their market thanks to standardised notations**