# Introduction to 4DIAC

**The Open Source Initiative for Distributed Industrial Automation and Control**

**4DIAC Users' Meeting
ETFA , Bilbao, Spain
September 16, 2010**

**www.fordiac.org**

# **Mission**

**The goal of the 4DIAC Initiative is to provide an open, IEC 61499 standard compliant foundation, that gives the opportunity to establish an automation and control environment, based on the targets**

➢ **portability,**

➢ **configurability and**

➢ **interoperability.**

# **Short History**

- Need for basic infrastructure in 2 research projects

- Development of runtime environment and engineering tool

- Provision of results as initial open source version in 4DIAC

  - Consent of all involved project partners

  - Common basis for development, industrial appliance and research of IEC 61499

  - Leveraging the use of IEC 61499 within industry

- Further development by initial committers: PROFACTOR GmbH & Vienna University of Technology

- Industrial/commercial usage by NXTcontrol
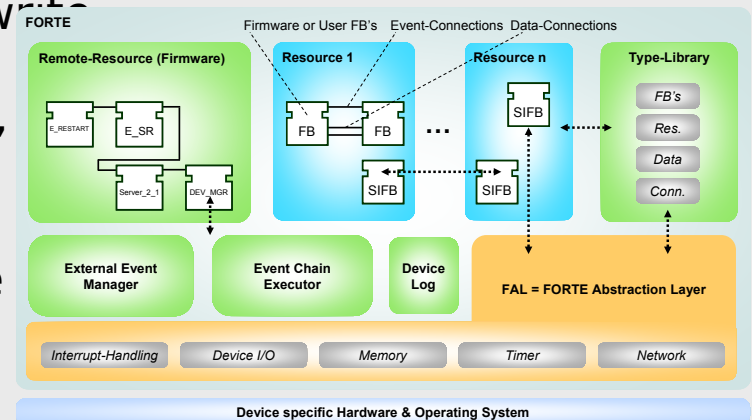
# Actual Projects

- FORTE (4DIAC-RTE)
  - IEC 61499 compliant run-time environment
  - C++ implementation
  - Portable to multiple platforms
- 4DIAC-IDE
  - IEC 61499 compliant engineering environment
  - Java-based implementation
  - Implementation as Eclipse plug-ins

# FORTE

- Features
  - Basic FB's, Composite FB's, SIFB's, Adapters
  - Elementary data-types according to IEC 61131-3
  - Event & data connections
  - Configuration commands (create, write, start ... according to IEC 61499)
  - Communication FB's (Server/Client, Publish/Subscribe for Ethernet)
  - Type-Library & Device Log
  - RMT-Device, RMT- & EMB-Resource
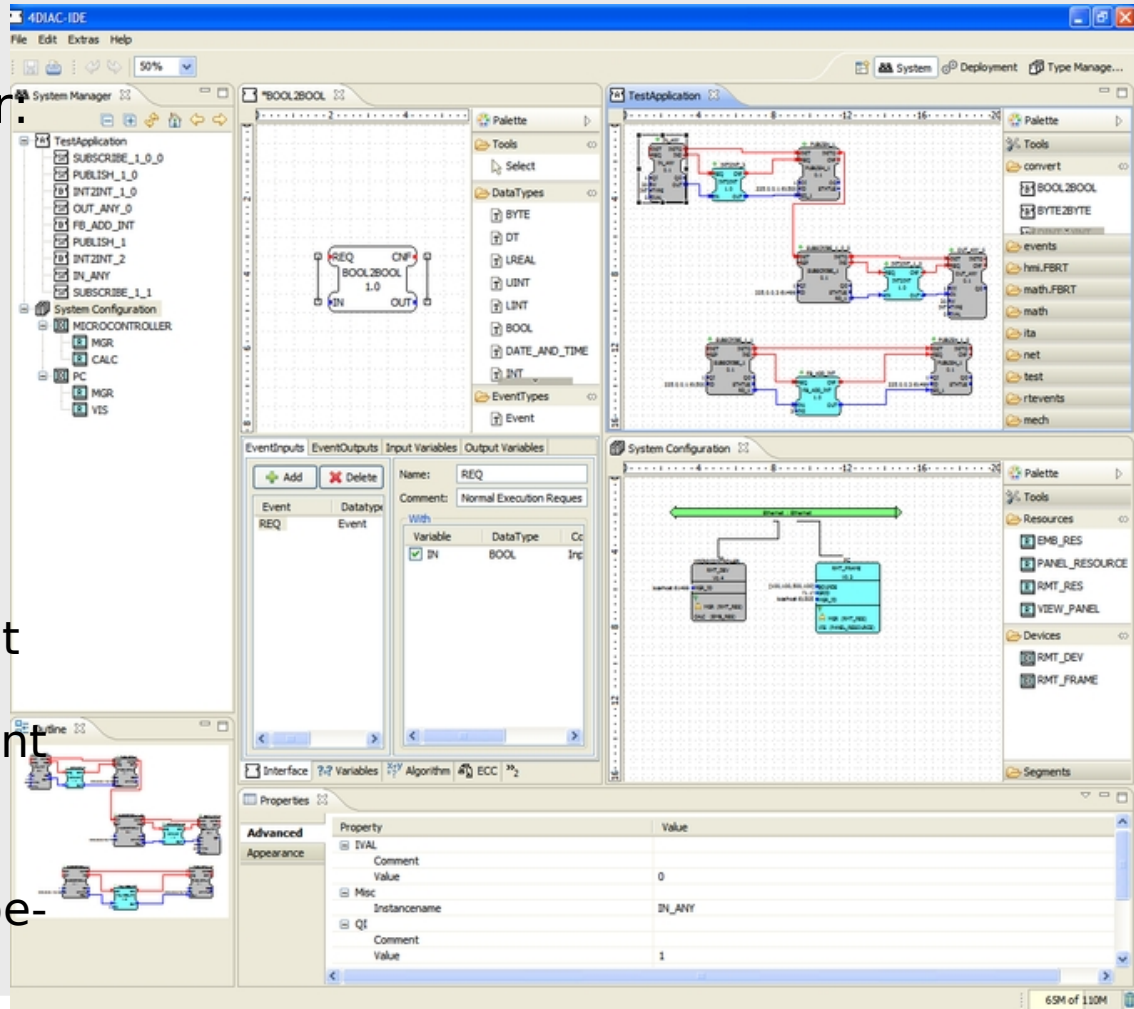  - Real-time event FB's
- Platforms
  - Posix (tested on: Cygwin, Linux (i386, PPC))
  - Digi Connect ME (ARM7, ThreadX)
  - eCos (ARM7, Lego Mindstorms NXT)



FORTE
Remote-Resource (Firmware)  Resource 1  Resource n  Type-Library
Firmware or User FB's  Event-Connections  Data-Connections
E_RESTART  E_SR  FB  FB  ...  SIFB  FB's / Res. / Data / Conn.
Server_2_1  DEV_MGR  SIFB  SIFB
External Event Manager  Event Chain Executor  Device Log  FAL = FORTE Abstraction Layer
Interrupt-Handling  Device I/O  Memory  Timer  Network
Device specific Hardware & Operating System

# 4DIAC-IDE

## Features

- Function Block Editor:
  - Basic FB's
  - Composite FB's
  - SIFB's
- System Editor:
  - support for sub-applications
  - mapping
- Deployment:
  - support for different profiles
  - separate deployment possible
- Project Management
  - project specific Type-Libraries

# Most recent changes

- FORTE:
  - Optimizations of performance & size
  - New implementation communication interface
  - Unit test integration
  - Initial version STRUCT datatype
- 4DIAC-IDE:
  - New routing algorithm
  - Adapter editor
  - Virtual DNS
  - Online Edit
  - Deployment perspective: clear resource/device
  - Merge editor for C++ export

# Interaction users-developers

- Hosted on SourceForge-Platform

- Bug-Tracker

- Feature requests

- Forum



- PLEASE provide feedback, questions, etc. via the offered channels

- Feedback helps to improve quality

**4DIAC Users' Meeting - Introduction**

# Involvement in development

- Bug-list / feature-requests as starting point for involvement
- Source code provided in distributed version control system "Mercurial"
- Quality of source code shall be maintained/improved
  - Towards test-driven development
  - Patches of collaborators will be reviewed and applied
  - Committer's rights have to be earned

# Next steps

- Roadmap
  - Based on feature requests and discussions among developers and users
- Marketing

- General 61499 discussion forum

# Thank you for your attention!

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