

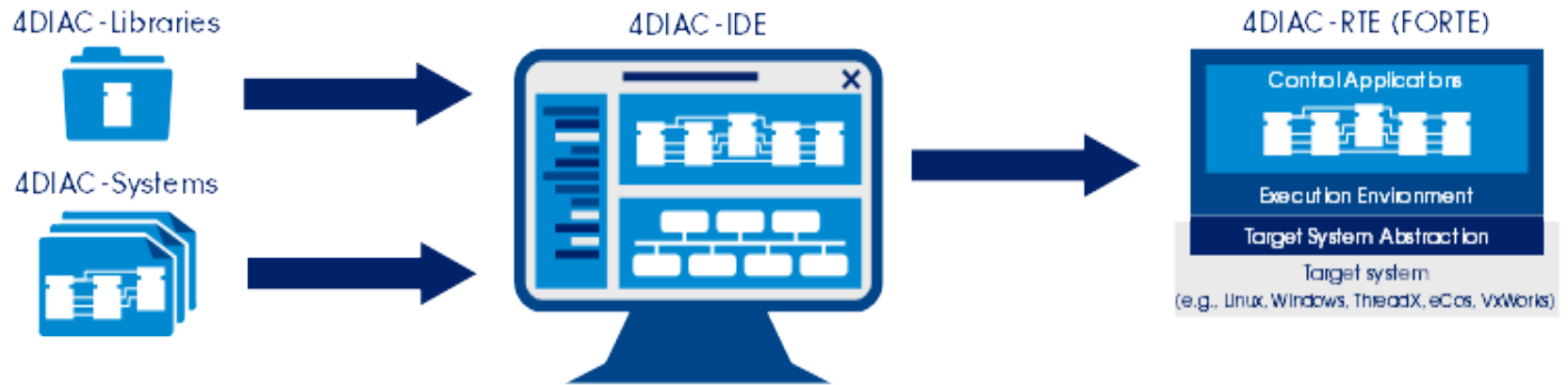


Project Introduction / Update

*Eclipse Unconference
IoT Working Group
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What is the Problem?

4DIAC Environment



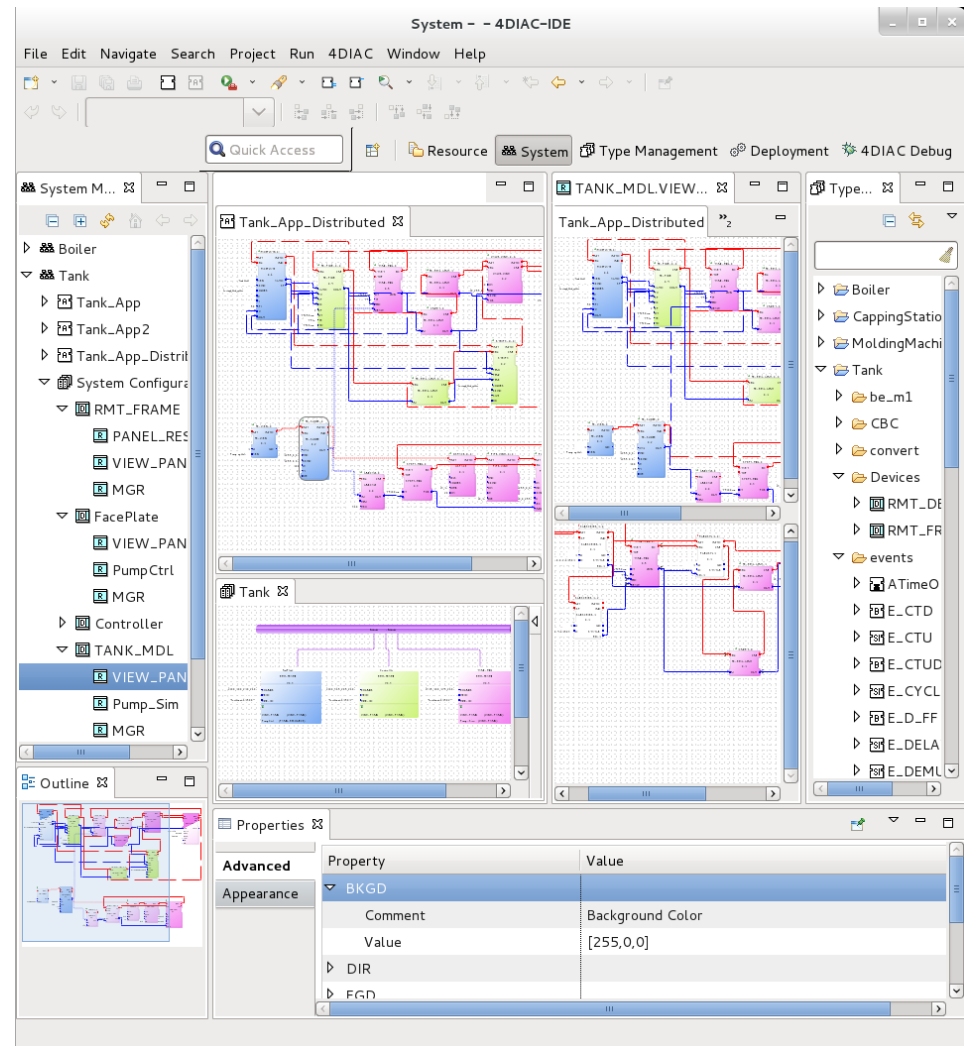
enables



Engineering Tool: Application/Distributed System Development



- System Editor:
 - Application modeling
 - Support for sub-applications
 - Device and network specification
 - Mapping
- Deployment:
 - Support for different profiles
 - Separate deployment possible
- Project Management
 - Project specific Type-Libraries



Engineering Tool: Function Block Development



- Types
 - Basic FB's
 - Composite FB's
 - Service Interface FB's
 - Adapters
- Code generation (C++)

The screenshot displays the 4diac engineering tool interface with several windows open:

- Project Explorer:** Shows a tree view of project components including folders like 'convert', 'events', and function blocks like 'E_CTD', 'E_CTU', 'E_CTYD', 'E_CYCLE', 'E_D_FF', 'E_DELAY', 'E_DEMUX', 'E_F_TRIG', 'E_LDU', and 'E_MERGE'.
- E_CTU Editor:** Shows the internal logic of the 'E_CTU' block. It includes an 'Event' table with columns for Name, Data, Comment, and With. The table contains:

Name	Data	Comment	With
CUO	Event	Count Up Output Event	
RO	Event	Reset Output Event	

 Below the table, there are checkboxes for 'Q' (BOOL, CV=>PV) and 'CV' (UINT).
- Event Inputs/Outputs Table:** Shows a table with columns for Name, Data, Comment, and With. It lists 'CUO' and 'RO' with their respective data types and comments.
- Service Sequence Editor:** Shows a sequence of service transactions for the 'E_CTU' block, including 'Initial Count-up', 'Count up and reset with', and 'Count up with changing f'.
- FB_CONTROL_SET1 Editor:** Shows the configuration for a control set. It includes a table for parameters:

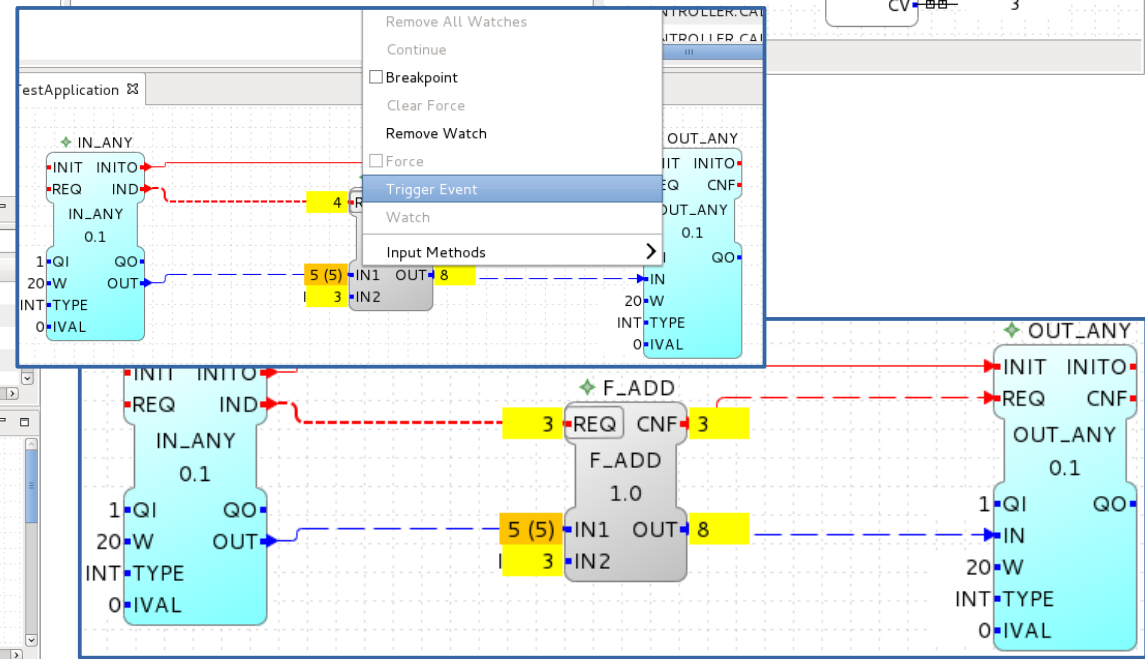
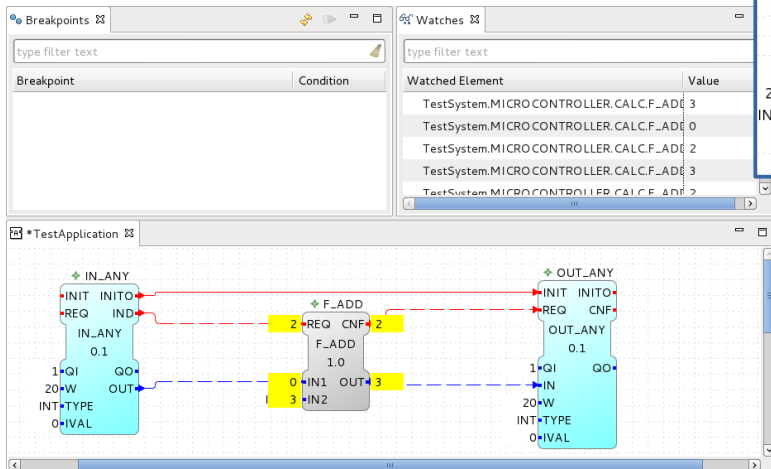
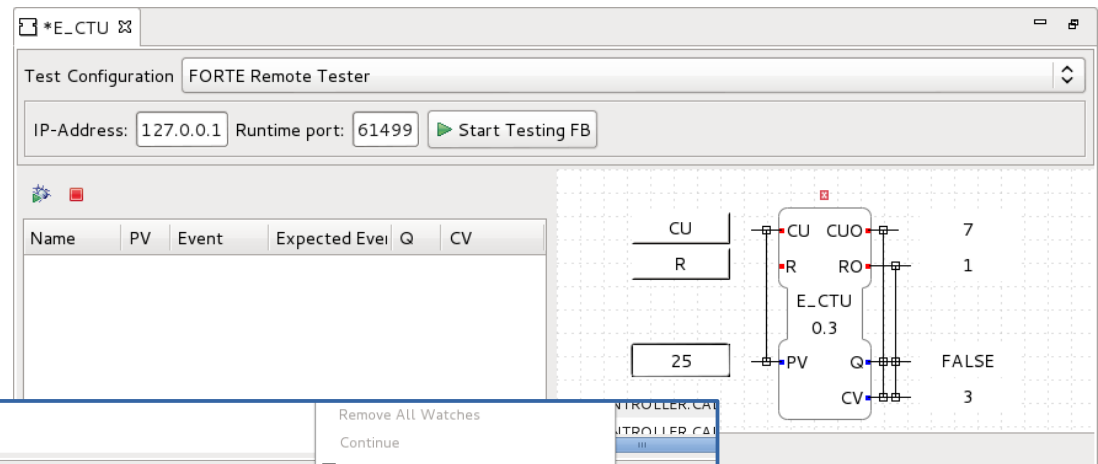
Algorithm	Language
REQ_P	ST
REQ_PI	ST
REQ_PID	ST
CALC_KI	ST

 The 'Language' is set to 'ST'. The algorithm code is:


```

1 KP := PID_K * KT;
2 TN := PID_TN * TT;
3 TV := PID_TV * TT;
4
5 CALC_KI ();
6
7 KD := KP * TV;
            
```
- FB Editor (GripperCtrl):** Shows a state machine diagram for a gripper control. States include 'START', 'Home', 'WorkpieceFree', 'Capped', 'Gripped', and 'PressureMonitoring.Finished'. Transitions are triggered by events like 'PickAndPlaceUnit.PickCap' and 'Gripper.Close'.
- Property Window:** Shows the properties of the selected function block, including 'Event', 'Interface', and 'Parameters'.

- Test Function Blocks
 - On target device
 - Manual
 - Automated unit tests
- Investigate Applications
 - Watch interface elements
 - Trigger events
 - Force values

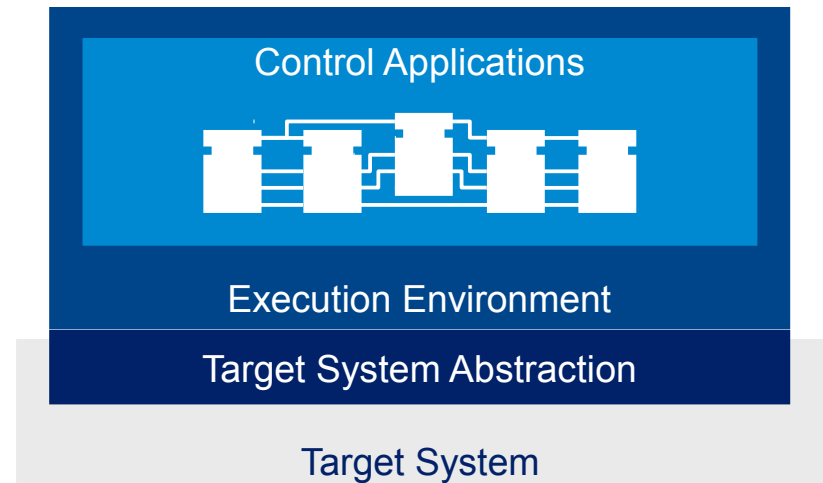
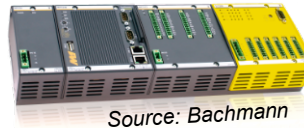
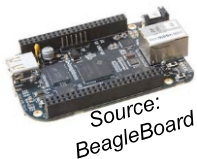


Operating Systems

- Windows
- Posix: Cygwin, Linux (i386, PPC, ARM), (VxWorks, QNX)
- NET+OS® 7
- eCos

Devices and Dev-Boards

- Lego Mindstorms nxt (ARM7)
- Digi Connect ME® (ARM7)
- CBC v2 robot controller
- Raspberry Pi
- BeagleBone
- Bachmann electronic M1 PLC
- Wago PFC 200



Communication Support

- EclipseSCADA SFP
- Ethernet (TCP/UDP)
- Ethernet PowerLink
- Modbus TCP Client
- MQTT (Eclipse Paho)
- OPC DA Client
- RS232

- *Open source since **July 2007***
 - *Development started 2005*
- *> 22.600 Downloads*
- *~400k lines of code*
- *9 comitters from 5 companies*
 - *3734 commits since 2010*

In the last year we had:

- *2 major and 5 minor releases*
- *4900 downloads*
- *101 closed tickets*
- *650 commits from **12 contributors***
- *445 forum messages*

- *Migration to Eclipse*
 - *Identify contributors and dependencies*
 - *FORTE 95% complete*
- *Next release: 1.8*
 - *4DIAC-IDE*
 - *Usability improvements in IDE*
 - *New icon set*
 - *Monitoring of adapters*
 - *FORTE*
 - *Integration of LUA engine for dynamic type loading*
 - *Performance improvements*
 - *New Hardware:*
 - *RaspberrySPS*
 - *Lego Mindstorms EV3*

- *Work through 10 years of development history (cvs, svn, hg)*
- *Dependencies*
 - *OSes*
 - *Linux*
 - *Windows*
 - *ThreadX*
 - *Ecos*
 - *Upcoming*
 - *FreeRTOS*
 - *Vendor Specific*
 - *Wago PFC200 KBus library*
 - *Bachmann electronic M1 libraries*
 - *Libraries*
 - *Libmodbus (<http://libmodbus.org/>)*
 - *Eclipse Paho*
 - *EclipseSCADA SFP*
 - *OPC Client library release 0.4 (<http://sourceforge.net/projects/opcclient/>)*
 - *Boost (<http://www.boost.org>)*
 - *Boost Test*
 - *Lexical Cast*
 - *openPOWERLINK V1.8.0 (<http://sourceforge.net/projects/openpowerlink/>)*

Dependency wrapping key USP of 4DIAC!

- *EclipseSCADA*
- *MQTT payload specs*
- *IP handling*
- *Communication protocols in general*
 - *Horizontal*
 - *Vertical*
- ...