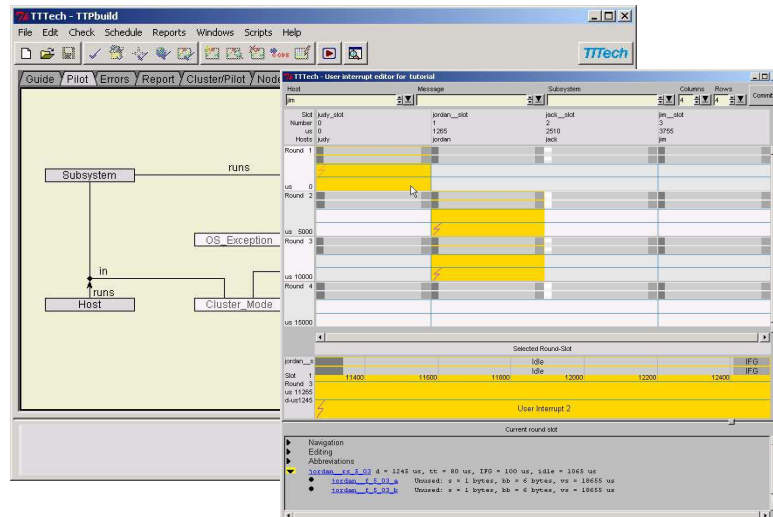


## TTTech Automatic Task Scheduling



### TTPBuild – The TTP Node Design Tool

TTPBuild is a comprehensive tool for the design of nodes in a TTP® network. It establishes the interface between the communication system and the application. Major steps of the design process are the configuration of the operating system and the generation of the fault-tolerant communication layer. The automatic generation of schedules and code reduces development time and produces higher-quality interfaces. It's exceptionally easy to update and change the interfaces.

#### Consistent and Complete Design

TTPBuild supports the precise definition of the temporal behavior of the tasks in a node and of the messages sent and received by them. Thus, the interfaces between the tasks of the node are completely defined in both the value and time domains. Defining the relevant objects and the relations between them specifies the node design. Communication interfaces are specified for every task. Once the node schedule has been specified, TTPBuild checks the design for correctness at the object, local, and global levels. Inconsistencies can be removed easily. The error browser offers detailed explanations and hyperlink functionality. By simply clicking on an error message, the appropriate form is opened and the error can be corrected.

#### Task Schedule Generation

Once the model is defined, TTPBuild can automatically generate a task schedule for the node. In the next steps, TTPBuild can generate C-code for a fault-tolerant communication layer (TTPFT-COM), as well as the configuration for the operating system used by the node. Additionally, it generates a customized communication schedule (MEDL – message descriptor list), which is to be loaded into the TTP controller of the node.

#### OS Configuration

TTPBuild generates the configuration for the embedded operating system (e.g. TTPOS). The operating system configuration integrates the generated TTPFT-COM layer with the application software tasks. TTPBuild supports TTPOS, TTTech's time-triggered operating system. On request, TTTech provides configurations for other operating systems.

## Functionality

- Clear and easy-to-understand object model
- Check of input data against object model
- High-level automatic scheduling algorithm for tasks
- Optimal scheduling algorithm for automatic generation of <sup>TTP</sup>OS schedules
- Generation of optimized C-code for fault-tolerant communication layer (<sup>TTP</sup>FT-COM)
- Schedule and code generation is available for custom-made hardware
- Personalized configuration data (MEDLs) generation for optimized CNI (communication network interface) usage. <sup>TTP</sup>Verify is used for verification of configuration data.
- <sup>TTP</sup> multiplexing support
- Support for austriamicrosystems AS8202NF <sup>TTP</sup> communication controller
- Support for array-type messages
- Error browser with hyperlink functionality for quick and easy debugging
- Report generator for standard and custom reports
- Context-sensitive help
- Guided mode for first-time users, object browser for experienced users
- Graphical editor for user interrupts
- Batch mode execution for automated usage via script files or integration with complementary tools such as <sup>TTP</sup>Matlink or comparable interface tools
- Flexible programming/scripting interface (Python)

## Features of the Fault-Tolerant Communication Layer (<sup>TTP</sup>FT-COM)

- Message/frame mapping
- Packing/unpacking
- Handling of replicated redundant message instances
- Bit-sized messages
- Message stability
- Message agreement (replica determinism)
- Application-specific agreement algorithms
- Byte ordering (endianess)
- Sender status
- Re-integration (history state handling)
- Standard ANSI C code allows easy integration into a broad variety of embedded system platforms

## System Requirements

- Operating system: MS Windows 2000 (SP 1 or 2), Windows XP (support for other operating systems is available upon request)
- Processor: Intel Pentium 4 or above, AMD Athlon XP or above, or compatible (1.5 GHz or above recommended)
- Disk space: 30 MB
- RAM: 256 MB (minimum), 512 MB (recommended)
- Graphics: 1024x768 16-bit colors (minimum), 1280x1024 32-bit colors (recommended)
- CD-ROM drive, Adobe Acrobat Reader 4.0 or above

<sup>TTP</sup>Build is part of the <sup>TTP</sup>Tools software development suite.

Subject to changes and corrections.

For further information, including price and availability, contact [products@tttech.com](mailto:products@tttech.com).

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