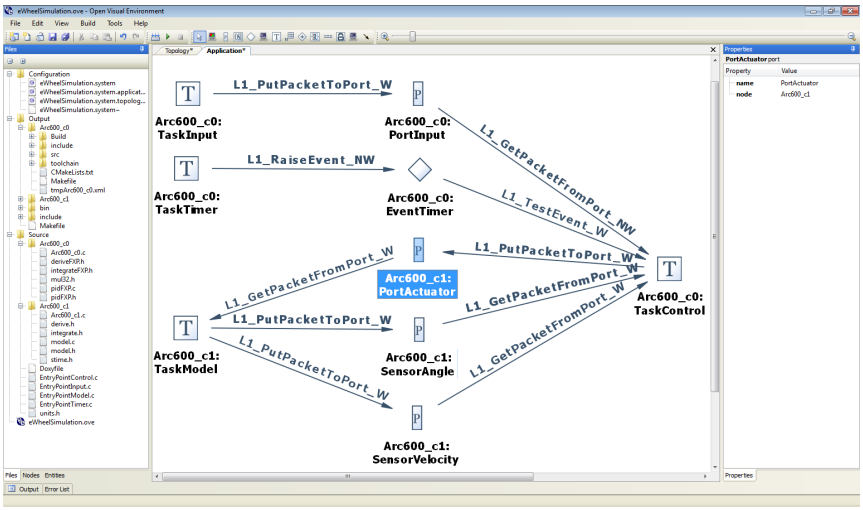
VirtuosoNext™ Visual Designer

A Unified Visual Development Environment for Trustworthy Embedded Applications

Developing distributed real-time embedded applications used to be hard. The development is even harder when the requirements dictate the use of heterogeneous target processors. The target processors might use different runtime environments, including legacy Operating Systems. Altreonic's Visual Designer provides the solution using visual modelling and code generation.



Using metamodeling, embedded software engineers can define their own targets, target topology, application topology. They can graphically create the program code, build and run the executable images. Before the final target is used, they can run the application on a host operating system such as Windows or Linux, allowing them to verify the behaviour. A built in event tracer allows users to verify the scheduling and task interactions. Once done, a small click of the mouse changes the target processor for each node and with little or no source code changes, it generates code for the final target. The event tracer displays the execution trace on the host. The host nodes can even remain part of the system e.g. for accessing stdio services, graphic displays, file services, etc.

Five easy steps to develop a distributed multi-tasking application:

1. Define the topology:

- Put the processing nodes on the canvas and connect them
- Select to enable Task protection or not for each node

2. Define the application:

- Put the tasks on the canvas, define the properties
- Put the interaction icons on the canvas by selecting from the menu events, semaphores, ports, fifo's, resources, memory pools, packet pool or generic hubs
- Add a host server task to interact with the application
- Connect tasks and interaction icons. Select from the available services.
- Add your application specific code.

3. Build:

- Visual Designer will generate data structures, add drivers and system tasks,
- Generate routing tables and makefiles.
- The diagram is regenerated from the source code.

4. Run and watch.

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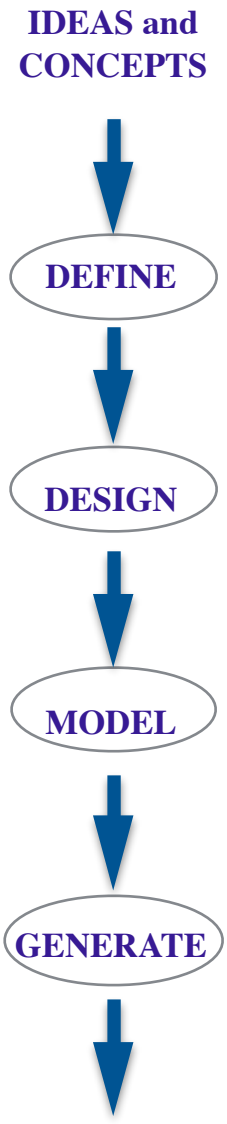
Trustworthy Embedded Systems Engineering



What are the benefits of VirtuosoNext Designer?

1. Productivity.
The real-time embedded engineer only needs to use a single integrated environment for specifying and modeling his embedded software architecture, to simulate it and to generate code for his target. Once done, the tool will regenerate the model from the source code.

2. Target independent.
Visual Designer is based on a metamodel concept. New VirtuosoNext services, can be added without changing the kernel. Define a suitable icon and the service becomes part of the enhanced RTOS. Adding a new target processor is as simple as adding a folder to the file system. What's more, the target system can be heterogeneous, covering 8bit, 16bit microcontrollers, high-end 32 or 64bit processors, DSPs, FPGA-coprocessing blocks, to legacy operating systems providing access services.

3. Trustworthy development.
Writing software is an error prone process, especially when the application is complex and consists of a large number of interacting and concurrent entities. Visual Designer makes this straightforward whereby applications can be drawn on the canvas. The whole framework code is generated so that the developer only has to fill in the core functions.

4. Performance and safety.
Visual Designer supports the VirtuosoNext programming model. The latter was developed and verified using formal modeling and is a breakthrough RTOS design. It has a very clean and safe architecture, 5 to 10 times smaller than equivalent RTOS designs. No buffer overflows are possible and full scalability is guaranteed. The programming model remains the same, whether programming single processors, many-core CPUs or networks of widely distributed processing nodes.

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