



Mirabilis Design introduces VisualSim Avionics Full-duplex Switched Ethernet Library for next generation avionics systems development

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Mirabilis Design announces VisualSim Avionics Full-duplex Switched Ethernet (AFDX) modeling Library: a system-level modeling environment to design aerospace network architectures

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HIGHLIGHTS:

- VisualSim AFDX modeling library is a system-level modeling environment to evaluate the performance, power consumption and reliability of the aerospace network protocol using AFDX.
- Using the VisualSim AFDX library, engineers can model high level system bus and assemble various subsystem modules such as inertial platform, auto-pilot and displays that are connected to the data communication network.
- VisualSim AFDX library supports full duplex, double redundancy, high performance and deterministic/non-deterministic response time.

Mirabilis Design Inc. of Sunnyvale, CA today announced the release of a VisualSim Avionics Full-duplex Switched Ethernet (AFDX) Library that is used by designers and architects in the area of next generation avionics systems development to model AFDX-based Avionics networks. The blocks of this library can be integrated with other VisualSim libraries including hardware architecture components, software components and Ethernet to construct the full Avionics system. It can also be used to analyze the architecture of a multi-protocol bridge and AFDX switch System-on-chip (SoC).

“In the last year, the demand for AFDX-based system design has been growing rapidly”, said Deepak Shankar, Founder of Mirabilis Design. “Being a new technology with lot of possibilities, we felt there is considerable need for aerospace engineers to acquire a design tool to understand AFDX and to optimize the network topology. This library will help identify system bottlenecks, test the reliability and construct a visual prototype of the full Avionics systems.”

AFDX modeling IP library is an extension to the existing Ethernet, VME, and 1553 library set focusing on reducing effort of modeling complex avionics data networks. Using Mirabilis Design’s AFDX library one can model high level system bus and assemble various subsystem modules such as instruments, auto-pilot and ABS that are connected to the data communication network. This enables users to quickly evaluate the architecture of next generation avionics network architectures and run feasibility tests to improve performance, management of power consumption and obtain system configuration details for implementation.



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AFDX library is fully integrated with VisualSim Hardware architecture library and VisualSim Networking library. VisualSim AFDX library supports full duplex, double redundancy, high performance and deterministic/non-deterministic response time. The main elements of AFDX network library are:

AFDX End-Systems: The AFDX End system is the subsystem which is embedded in each avionics system's equipment connected to the network.

AFDX Switch: Each VisualSim AFDX switch has filtering, policing and forwarding functions with more than 4096 Virtual Links. The AFDX switch can operate in any topology including a star. Users can configure AFDX Switch module based on the requirement by varying parameters.

AFDX Virtual Links: AFDX Virtual links are part of the VisualSim library block and are defined as unidirectional logic path from the source end-system to all of the destination end-systems.

Key Features of AFDX Modeling IP:

1. AFDX Switch library with functions such as filter, routing, configuration and monitoring
2. AFDX Terminal Subsystem interface library with port service, Virtual Link, Redundancy Management.
3. AFDX Gateway(Custom and Standard)
4. GUI support for defining AFDX network topology
5. Analyze On-Line and Off-Line Simulation data, Display bus load and transmission latency.
6. Monitoring of events on switch, data arriving, CRC failures
7. Fault injection at device level, network and traffic.
8. Power consumption Reports at Network level and device level.

VisualSim Methodology

Designers construct system-level models by starting with VisualSim platform templates and adding on other library or user defined components, as required. Regression simulations are conducted by varying the parameter values in the simulation cockpit and selecting the desired output reports. In the early design phase, VisualSim models are abstracted using distribution-based traffic and delay functions to represent architecture components. These models help select viable architecture alternates and design attribute boundaries. With these performance constraints in the framework, the delay functions are replaced with the functional and cycle-accurate components from the Toolkit to refine and validate the microarchitecture.



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Availability

The VisualSim AFDX modeling Library is currently available on Windows, Linux and UNIX. The Library requires VisualSim Architect to construct models and simulate.

About VisualSim

VisualSim Architect is a graphical, platform-independent design environment used for performance analysis and power exploration of SoC and distributed system architectures. VisualSim accelerates model construction time by using pre-defined parameterized libraries rather than detailed C++ programming to define models. The automated statistics and visualization optimizes the initial concept through a series of parametric and topology refinement to deliver the best architecture. The models can be embedded in documents to be viewed and simulated from within a Web Browser.

About Mirabilis Design

Founded in 2003, and headquartered in Sunnyvale, CA, USA, Mirabilis Design is a leading provider of System-Level Architecture Exploration software for designing hardware and real-time software. Using VisualSim, designers can architect the “right” product, i.e. one which minimizes product failures and has not been over- or under- designed. Mirabilis Design accelerates Concept Engineering by drastically reducing typical model development from months to days and overall project time by 25-30%. Our customers are focused in computing, semiconductors, networking and aerospace. Benefits from the solution are a visual executable specification; easier creation of optimized and differentiated products and; corporate infrastructure enabling extremely fast design trade-offs for price, performance and power.

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