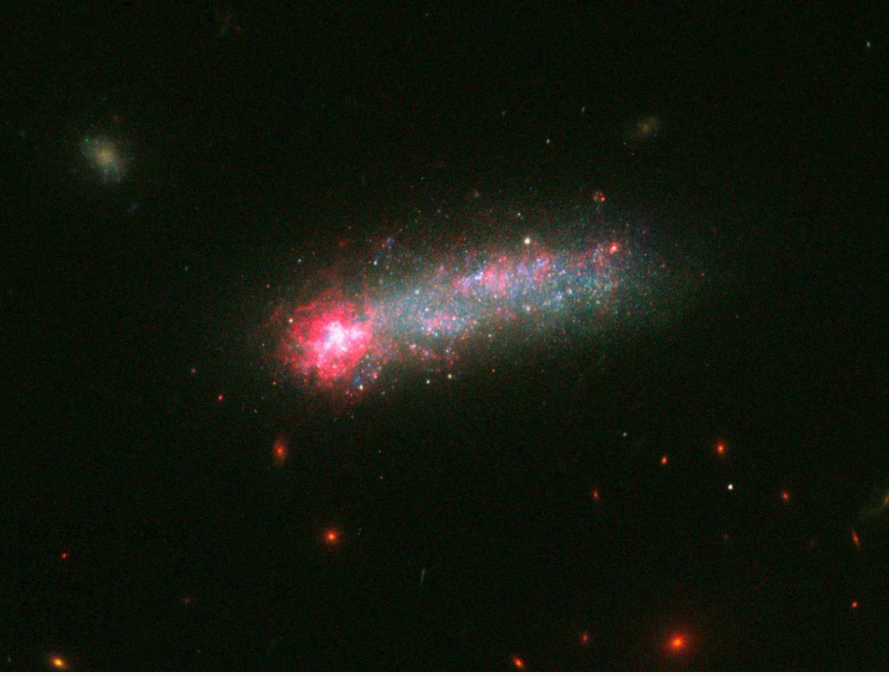

National Aeronautics and
Space Administration

technology solution

Information Technology and Software

# Simulator System

## A tool for developing and integrating distributed simulation components

NASA Goddard Space Flight Center has developed a modular communications architecture for distributed simulation systems. This provides developers with an interface for different types of synchronous communications. This software can be readily used by projects that use 1553 and/or SpaceWire communications. Synchronization libraries provide an API that maps efficiently to existing systems that make use of these protocols. They provide the structure that makes it easy for developers and analysts to take advantage of the virtual busses and perform test and analysis with interception. This technology provides a repeatable infrastructure to support the rapid development of distributed simulation components.

## BENEFITS

- Provides an interface for developing software-only simulations
- Provide additional utilities to support simulation users
- Synchronous nature of the software solves the problem of timing in distributed simulations
- Provides a consistent and correct mechanism to pass data over 1553.
- Data interception allows for an entire new type of dynamic testing without modification to the existing simulation environment

## THE TECHNOLOGY

The system consists of a central server and a collection of client libraries that provide different levels of functionality. The server is a standalone application that acts as the central hub of communication for one or more busses. Functionality levels currently include:
Base Layer implements the ITCSB core. All other layers are built on top of this one.
1553 is an implementation of the MIL-STD-1553B specification in which the hardware is replaced by an interface to the ITCSB Base Layer.
SpaceWire (SPW) is an implementation of the SPW bus.
Time Sync provides a way for multiple simulation components to synchronize on an arbitrary time frame.

The layered architecture separates the protocol-specific implementation from the core implementation. Additional utilities include a 1553 user interface and SpaceWire interface. The user interfaces provide visual representations of the data and provide the capability to intercept and modify data being passed by the system.

## APPLICATIONS

The technology has several potential applications:

- Development and integration of distributed simulation components
- Spacecraft simulation environments

## PUBLICATIONS

Patent No: 10027566

More Information

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NP-2015-04-1692-HQ

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GSC-16730-1
GSC-TOPS-100