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ESIM_DSN
WEB-ENABLED DISTRIBUTED SIMULATION NETWORK

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Abstract

In this paper, the *eSim*^{DSN} approach to achieve distributed simulation capability using the Internet is presented. With this approach a complete simulation can be assembled from component subsystems that run on different computers. The subsystems interact with each other via the Internet The distributed simulation uses a hub-and-spoke type network topology. It provides the ability to dynamically link simulation subsystem models to different computers as well as the ability to assign a particular model to each computer. A proof-of-concept demonstrator is also presented. The *eSim*^{DSN} demonstrator can be accessed at http://www.jsc.draper.com/esim which hosts various examples of Web enabled simulations.

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Introduction

For aerospace systems with many subsystems and subcontractors or design teams that are geographically dispersed, the capability to collaborate with each has obvious benefits. For one, location becomes irrelevant thus enabling the application of the best talent to a particular project. This is particularly relevant when applied to the simulation component of any aerospace project. Distributed analysis and simulation can be utilized in the design and verification phases. In this context, distributed analysis, refers to the capability to perform simulation based analysis from geographically dispersed locations with respect to where the simulation is hosted or maintained. On the other hand, distributed simulation refers to the capability to perform simulations, where some or all of the simulation components or elements are not collocated. This can include software elements, input elements or even hardware elements. In its most abstract definition, it implies that a simulation of a complete system at a single computing facility does not exist. This definition for distributed simulation is in contrast to a recent trend in distributed computing [1], usually referred to as "grid computing" or "peer-to-peer computing, P2P" or clustered computing, which distributes the simulation computational load among multiple computers.

In this paper, an approach, referred to as *eSim*^{DSN}, to achieve distributed simulation capability using the Internet is presented. The *eSim*^{DSN} approach capabilities are described as well as the benefits of using such an approach. An example is presented to illustrate *eSim*^{DSN} features and capabilities. It can be accessed at http://www.jsc.draper.com/esim/.