

NASA Glenn Research Center Relies on STK for Advanced Network Architecture Analysis, Modeling, & Simulation

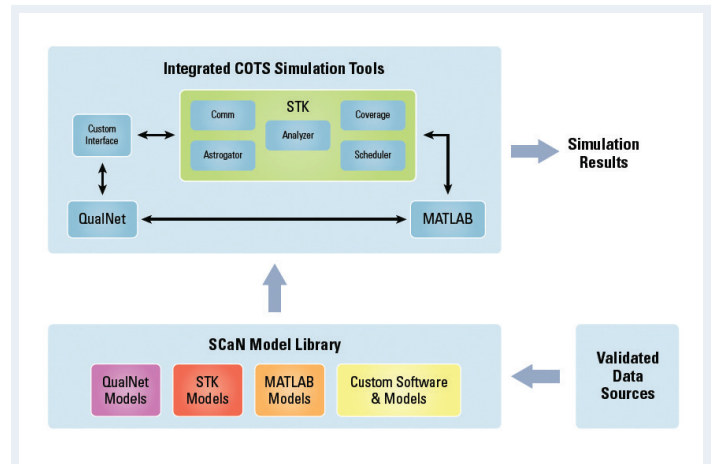
Communication Center Integrates STK with Other Tools

THE PERFORMANCE MODEL: At the center of this project was the need for a unified Space Communications and Navigation (SCaN) network infrastructure that would prove capable of meeting human and robotic space exploration mission needs. At the same time, NASA engineers strove to implement fully networked communication tools. This would allow them to provide the highest data rates for exploration. Doing so would ensure that data communication protocols for upcoming space exploration missions are operable internationally and provide communication and navigation infrastructure required in order to conduct potential Lunar and Mars surface missions.

THE MISSION BRIEF: In order to predict performance, personnel within NASA's Glenn Research Center modeled elements of official documents in one of its COTS tools. These included internal NASA documents, documents from NASA clients, and documents pulled from other standards groups. In some cases, they also generated custom models as needed. They then pulled these models into the Integrated SCaN to generate a number of studies. These included a Near Earth Network Low Elevation Study, a CCSDS Link Layer Security Impact Assessment, their Integrated Services Network Loading Study, and a Deep Space Network Coverage Analysis Study. All this was made possible by using AGI Technology—including STK Communications, Astrogator, Analyzer, Coverage, and Scheduler—as part of the SCaN Model Library and the Integrated COTS Simulation Tools.

"With new and more complex architectures, advanced simulation tools are required to do analysis. Something like STK, which is able to integrate multiple tools, has been very beneficial for this analysis. "

— MICHAEL FUENTES, NETWORK ARCHITECT
AND CONSULTANT



As NASA modernizes its space communications network toward higher data rates, enhanced network performance, and common interfaces; real-world testing using static analysis remains difficult and expensive. To reduce the resources required, NASA's Glenn Research Center employs commercial off-the-shelf (COTS) software such as Systems Tool Kit (STK) from AGI to create the Integrated SCaN (Space Communications and Navigation) Simulator.

THE RESULTS ARE IN: To evolve NASA's SCaN into an enhanced, integrated communication architecture by 2025; Glenn Research Center turned to STK software for a cost-efficient analysis of how proposed changes would impact current architecture. STK's flexibility and expandability have enabled architects to integrate other tools to address complex system and network architecture questions. STK currently serves across a number of NASA projects and research centers.