Space Telecommunications Radio System (STRS) Project Closeout

NASA TechPort

November 2021

STRS Project - Summary

Brief Summary of Completion / Accomplishment:

- STRS is an open architecture for NASA space and ground radios, providing a common, consistent framework to abstract the application software from platform hardware. The standard facilitates software reuse and portability between platforms.
- Since initiation in 2006, the project has:
  - Issued NASA-STD-4009A and NASA-HDBK-4009A, providing formal standard definition
  - Created a repository of STRS-compliant waveforms and applications for reuse
  - Developed stand-alone and Core Flight System reference implementations
  - Infused into Space Communication and Navigation (SCaN) program missions, most notably the three radios of the SCaN Testbed payload on the International Space Station
  - Facilitated industry standard adoption in the General Dynamics and L3-Harris software-defined radio product lines, with further use in customer missions
  - Collaborated with industry to create the Space Telecommunications Interface (STI) standard through the Object Management Group (OMG) consortium
- The project has met its goal of establishing an architecture, providing reference implementations, and infusing the architecture throughout NASA and industry.

Final TRL: 9

STRS Project - Results

Objective

- Collaborate with industry to establish an architecture and standards document
- Create software reference implementations and mission radio implementation
- Establish a repository for STRS-compliant software, allowing mission reuse
- Transfer the technology to industry for future improvement and management

Results

- NASA-STD-4009 was approved on June 5, 2014, establishing the NASA STRS standard.
- STRS application repository is public and contains 17 applications as of November 2021
- Reference implementations of the standard are available in stand-alone format and as a Core Flight System application to facilitate implementation on new radio platforms
- Industry adoption of STRS resulted in >80 space radios implementing the standard
- SCaN Testbed performed >3000 hours of testing of STRS on its 3 STRS compliant radios
- OMG has adopted the STI standard that is based on the latest NASA-STD-4009A as a beta release as of January 2021, with full approval pending

Significance

- STRS achieved its objectives through establishment of the NASA standard, development of multiple reference implementations, creation of an application repository, and transfer of the standard to management by OMG.