

# SPACEWIRE-RT PROTOTYPING

**Session: networks and protocols**

**Long Paper**

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## **ABSTRACT**

SpaceWire Real-Time (SpW-RT) aims to provide a consistent quality of service (QoS) mechanism for SpaceWire networks. It is intended to support reliable communication services and control applications where timely delivery is essential.

This paper presents the ongoing prototyping activities related with SpW-RT. They are a key element in the validation, and play an important role in the development of the initial set of protocols.

One group of prototypes and tools is being developed to assess protocol functionality and correctness. They include the implementation of SpW-RT in a high level language, targeting real SpW devices as well as SpW simulation tools. The use of software verification tools and formal validation is also being considered for this purpose.

The other group of prototypes aim to provide an insight on the performance and efficiency of the protocols when implemented with existing space-qualified hardware. The idea is to provide a solution based on SpW-RT equivalent to typical spacecraft communication architectures where multiple different busses are used.

The SpW-RT prototypes allow extensive customization for synchronous and asynchronous networks to support different QoS. A set of tools is being developed to assist the SpW-RT user with network design. The network analysis required to support timely delivery and FDIR (Fault Detection, Isolation and Recovery) techniques results in specific network topologies and SpW-RT parameters.