

THE SYSTEM APPROACH FOR A SPACEWIRE NETWORK

Session: SpaceWire Network and Protocol session

Short Paper

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ABSTRACT

For THALES ALENIA SPACE (TAS), the SpaceWire technology has been a growing RT activity and Spacewire technology is now fully considered in the overall TAS avionics roadmap. Thus, an internal TAS spacecraft avionics mock up has been developed with the following objectives:

- Breadboarding advanced projects for feasibility verification,
- Validation of traffic simulation tool (MOST) by comparison between simulation and real test ,
- Evaluate SpW features as SpW router, time code , GAR,
- Evaluate internal TAS Specification of any SpaceWire network including failure monitoring strategies (Status and error messages)
- Evaluate internal TAS Specification of high level protocol (RMAP & PUS)

This internal mock up has been developed in two steps :

- system specifications define SpaceWire network architectures and high level protocols (including a dedicated FDIR definition) in terms of space mission types:
 - define SpaceWire topologies and scenarios ,
 - define how to monitor the network and how to detect blockages and failures
 - define reconfiguration strategies,
- development of avionics mock up which include TM/TC functions, processor module, mass memory module, SpW router and payload modules providing science data. Applicative Software has been developed as middleware which has in charge the SpW handling. Global validation has been performed in order to verify the concept.

This activity allows TAS to :

- ⇒ easily build a representative SpaceWire mock up for any space system application,
- ⇒ guarantee that SpW simulation run on MOST tool is deeply representative and efficient
- ⇒ propose a failure monitoring strategies (FDIR) using a dedicated protocol based on SpaceWire standard.