

# SpaceWire networking Protocol

## Working Group Meeting 8

### Inter-Agencies meeting

Ph. Armbruster TEC-ED

## Inter-Agency meeting

### Agenda:

- WG Steering Group composition
- CCSDS SOIS
- RMAP Draft F
- Updates (enhancements) ECSS-E50-12A
- SpaceWire and PnP
- SpaceWire Backplanes
- SpaceFibre
- Next Events and new initiatives
- Next meeting (date, scope)

# SpW Working Group Steering Committee Meeting 8 (SpW WG StC Mtg 8)

## Steering committee

### **ESA (Chair)**

M. Suess  
J. Ilstad

### **JAXA/ISAS**

T. Yoshimitsu  
M. Nomachi (UoO)

### **NASA**

G. Rakow

### **ROSCOSMOS**

A.G. Sukhoroukov  
A. Stepanov

S. Parkes (UoD) and Pr. Y. Sheynin (UoStP) are also member of the SpW Steering Committee.

Ph. Armbruster excused due to other commitments

SpW WG Steering Committee: Coordinates/Approves PID allocations and supporting documents.  
Configuration management of in-preparation and published protocols.

Steering committee supported by: S. Parkes (UoD), acting as the SpW standard(s) Editor

SpW Working group contributors/participants: Agency engineering & projects representatives,  
Representatives from Industry, Experts

## CCSDS SOIS

SOIS stands for Spacecraft Onboard Interface Services

Meeting to be scheduled before the next CCSDS meeting in March in order to:

- Review services definition Red Books  
wrt. completeness and relevance  
consistency of quality of service  
(<http://public.ccsds.org/sites/cwe/default.aspx>)
  - Provide feedback to CCSDS SOIS WG
  - Investigate implementation over SpW  
Covering address translation, encapsulation, quality of service, retry and redundancy
  - Define a validation scheme through prototyping
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- Y. Sheynin, A.G. Sukhoroukov provide inputs from ROSCOSMOS
  - G. Rakow, R. Schnurr provide input to next SpW WG from NASA
  - ESA, JAXA to provide inputs as well
  - S. Parkes to act as focus point for the inputs (with CC to SpaceWire Secretary)

## **RMAP Draft F**

During the WG meeting the Draft F was discussed by:

- Presentation by UoD on Draft E to Draft F evolutions
- Comments expressed by Saab Space
  - Saab is asked to supply a short note describing the three points mentioned during the meeting
- Comment expressed by 4Links
  - Reference that RMAP RMW is support the implementation of semaphores should be removed
- Comment from Astrium GmbH
  - Provide more diversity in examples in order not to induce that a return path address is 4 bytes long

Conclusions:

- RMAP Draft F is considered as ready by the SpW WG to be frozen.
- RMAP Draft F including the proposed clarifications can be submitted to ECSS and serve as basis for standardisation.
- ESA will propose the RMAP to ECSS for standardisation in 2007

## SpaceWire and PnP

During the WG group meeting the following points were discussed:

- Different schemes presented, more or less HW and baseline SpW friendly (I.e.)
  - SW based only (cf SWI presentation)
  - Implying SpW Routers support only
  - Make use of existing features in SpW\_10X router and RMAP protocol
- Working Group in the US (coordinated by G. Rakow)
  - Needs more consideration for the working group to define:
    - Exact need of PnP for space systems (e.g. satellites, EGSE, integration, formation flying)
    - Understand requirements justifying CCSDS SOIS introduction of PnP “services”
  - ESA would like to participate in the PnP WG teleconf discussions (M.Suess, A. Ferrer)
  - G. Rakow will provide presentations on PnP for the SpW WG web site

## Leading zero handling before Protocol ID

- Discussion of handling of a leading zero before the destination logical address and protocol identifier.
- It is recognized during the discussion that a packet with a leading zero should be handled as a configuration packet.
- This function could be beneficial for the implementation of network discovery.
- Broader concepts of node configuration were discussed and should be considered further.
- S. Parkes will write a note on this subject for the next SpW WG meeting with input of G. Rakow, M. Nomachi, Y. Sheynin

## Updates (enhancements) ECSS-E50-12A to be included in the next issue of the standard

Proposed enhancements have been discussed during the WG meeting:

- Introduction of Distributed Interrupts (Presentation of Y. Sheynin)
- Cable and connectors specification should be further detailed.  
(Provide electrical characteristics/requirements rather a prescriptive description).
- Standardization of additional connectors
  - JWST connector ?
  - Circular connector ?
- Clarification of the notion of a multi link end-node
- Redundancy mechanism as used JWST
- Starting frequency during link initialization ?
  - Today 10Mhz +/- 10 %
  - Evolution from 2Mhz to 10MHz (+/- 10%)
- The SpW WG is asked to propose further amendments. Proposed amendments should be backwards compatible to the standard.
- The time frame for work on a new issue of the standard is 2008
- G. Rakow will contact JWST to allow GORE to release related information.



## SpaceWire Backplanes

- SpaceWire links are already propagated via backplanes and/or flex connections.
- No consensus on standardizing a SpW based backplane has been identified during the WG meeting.
- Best/good practices for the routing of SpW links via backplanes could be shared within the community.
- G. Jackson and D. Rafael from NASA will be asked to provide documentation on the MMS backplane implementation to stimulate the discussion on this subject.

## SpaceFibre

- The Spacefibre demonstrator has been presented during the WG meeting.
- Trade-offs and proposed recommendations for SpaceFibre will be presented in a working meeting this afternoon.
- S. Parkes to provide detailed documentation on the work performed so far to be published on the WG web page.
- Feedback from SpW WG is encouraged.

## Next Events and new Initiatives

The following points have been discussed during the WG meeting.

- First International SpaceWire Conference, 17-19 Sep. 2007
  - Permission to use the logos of the Space Agencies needs to be received by S. Parkes by 2.2.2007 in order to be present on the 1<sup>st</sup> call for papers.
- SpaceWire Community
  - The SpW steering committee encourages participants to establishing of a SpaceWire Community as an independent forum for companies to present their SpW products and place for information exchange.
- SpaceWire Handbook
  - This effort should be organized by the SpW Community.
- EU FP7 Proposals
  - It was advised that the FP7 call for proposals is opened.
  - The possibility of proposing a particular work item in a future FP7 call should be investigated covering international standard harmonisation.
  - Specifically this should cover onboard data handling or SpaceWire standards.
  - Action on A.G Sukhoroukov , M. Suess, S. Parkes

## Next SpW Working Group Meeting

- The next meeting will be dedicated to discussion of the SpW WG inputs to CCSDS SOIS
- Date: **New ! 26<sup>th</sup> (all day) and 27<sup>th</sup> of April**  
(Previous dates 29, 30 March 2007)
- Place: ESTEC, Noordwijk, The Netherlands