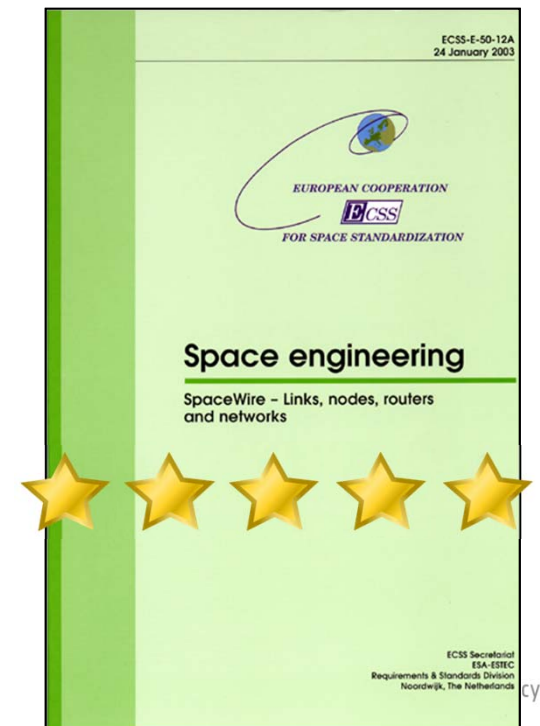# ECSS SpW standard revision Scope and Agenda

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SpW WG mtg #18
24/04/2012

Scope (1/4)

1. Based on the 54 Change Requests
   a. Posted by SpW community (mainly SpW WG)
   b. Processed in details and in length by the SpW WG (thanks!)
2. Most of them technically closed
   a. Ready to be standardised
3. A few of them still open
   a. Needed technical work
   b. Have been tackled through the "SpW Evolutions" TRP activity

4. Number	5. Location of deficiency		6. Changes	7. Justification	8. Disposition
	clause (e.g. 3.1	page 14)			
3	Whole docu ment	all	Clarify definition and behaviour of "nodes" and review all node-related requirements. The term node should be only used as abstract end point (terminal) of the network and not for a physical unit. Introduce a different term (e.g. device) for electronic modules or units in the network which can contain one or more SpaceWire interfaces. Introduce a single configuration ports for devices and the permission to contain a routing capability.Remove a number of ambiguities raised by the SpW users (mainly the Working Group).	As reported in [3], [4], [94], [95], [98] and [100]: Some requirements in ECSS-E-ST-50-12C refer to the term "node" as some electronic module or unit comprising one or several SpW interfaces while other requirements refer to the term "node" as the SpW interface itself as a terminal of the network. This has been creating a lot of confusion, specifically when trying to define other protocols operating on top of SpaceWire. Amongst the related confusion is the Time-code usage in particular and time distribution in general, which is severely impacted by the definition of a "node". Another source of confusion is whether a packet with unexpected destination address shall be discarded, since RMAP does not follow this rule. Moreover, the design of SpaceWire higher level protocols such as Plug-And-Play require a clear definition of items to be discovered in a SpW network, and the assignment of a configuration port to each of these items. At last, some discussion in the SpW WG is ongoing whether aligning the definition of nodes to the one of routers (with e.g. the possibility for nodes to switch characters/packets) would clarify this definition and help supporting PnP.	Clarify the terms "port", "link", interface", "router", "node", "end-point", etc. w.r.t. SpaceWire as part of the revision of the standard. "SpW definitions update" stream: redefining endpoints, nodes, units, logical network, etc.
4	Whole docu ment	all	Carefully improve the protocol description and consistency formalism (clear layering) and precise the use of some terms (e.g. switching instead of routing) and clearly describing for each protocol "level" the description of syntax, synchronisation, semantics; and include a description of the Service Access Points.	As reported in [2], [11], and [99]: SpW does not involve routing (OSI layer 3) but only switching (OSI layer 2). In literature the term Wormhole switching is widely used as a synonymous of wormhole routing. However, the development of SpaceWire higher level protocols in general and the SOIS stack in particular involves routing. The use of this term at SpW level therefore may create confusion. Moreover, the ECSS-E-ST-50-12C Standard mixes for each protocol "level" the description of syntax, synchronisation, semantics; and it does not describe the Service Access Points. The advantage is that it facilitates the first reading/understanding of the major features of SpaceWire but it also increases the risk of ambiguities when it comes to detailed understanding and implementation	Keep the overall layering as it is but remove any kind of (minor) mixing/overlap between layers in the current standard and clearly define Service Access Points.

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4. Number	5. Location of deficiency		6. Changes	7. Justification	8. Disposition
	clause (e.g. 3.1)	page 14)			
8	7 & 8	52 to 86	Introduce Interrupt distribution codes or more general low-latency signalling codes	As reported in [86], [48], [51], [52], [53], [54], [55], [46], [47], and [49]: A possible use of one reserved state of the two "control bits" of the SpW standard to allow low-latency distribution of interrupts across SpW networks was presented to the SpW Working group several times. The technical solution was discussed thoroughly and improved. Some optimisation of this technique allowing low-latency distribution of any kind of signalling code, included but not limited to interrupts and time codes, was recently presented to the SpW Working group. Once validated by ESA through breadboarding, the feature will be ready for introduction into the new release of the standard.	Include the Distributed Interrupts or more general low latency signalling codes as a new feature in the revised standard. For this, one or more of the three reserved states of the two control bits shall be used.

"Distributed Interrupts" stream: improving SUAI proposal (timing issues ?)

Scope (4/4)

4. Number	5. Location of deficiency		6. Changes	7. Justification	8. Disposition
	clause (e.g. 3.1	page 14)			
29	8	57	Introduce simplex and/or half-duplex mode(s).	As reported in [61] and [62]: For many high speed payload data applications only a simplex connection from the instrument to the memory is required. In these cases the back channel provided by SpaceWire is often seen as unnecessary complexity and cable mass. It has been proposed to modify the SpaceWire codec and the state machine to support simplex operation. Also the possibility of a half-duplex SpaceWire implementation has been suggested.	Not to introduce simplex and half-duplex in the update of the SpaceWire standard unless more detailed explanations on the technical solution and on the impact on the current SpaceWire standard are provided very soon.

"Simplex and Half-Duplex" stream: studying the relevance and technical solutions for simplex and for half-duplex SpW

Agenda

1. ECSS New Work Item approved

    a. Financial resources approved for WG members (industry)

    b. Manpower approved for ESA coordination

2. Working Group membership approved

PersonName	Position	Company Name	Nominated by
Bouabdallah, Ahmed	WG Member	TELECOM Bretagne	Eurospace
Cook, Barry	WG Member	4Links	Eurospace
Dellandrea, Brice	WG Member	Thales Alenia Space	Eurospace
Hult, Torbjorn	WG Member	RUAG	Eurospace
Isomaki, Makro	WG Member	Aeroflex Gaisler	Eurospace
Jameux, David	WG Convenor	ESA	ESA
Joerg, Stefan	WG Member	DLR	DLR
Nickl, Mathias	WG Member	DLR	DLR
Notebaert, Olivier	WG Member	Astrium Satellites	Eurospace
Parkes, Steve	WG Member	University of Dundee	ESA
Rastetter, Paul	WG Member	Astrium Satellites	Eurospace
Vigeant, Fabien	WG Member	CNES	CNES

1. Work plan

    a. Kick-off meeting 22 May 2012

    b. 3 other meetings (every 2 months)

    c. ECSS draft standard for public review

Conclusion

1. "SpaceWire Evolutions"
   a. TRP
   b. 150k€
2. 3 streams presented in this session:
   a. Update of SpW definitions
   b. Distributed Interrupts
   c. Simplex and Half-Duplex SpW

Thank You

European Space Agency