

SpaceWire-based Protocols (SbP) stack with a focus on management protocols

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European Space Agency

Lack of management service for SpW



Network Level	[dest. address]	Network Level	[header byte] [port enabled]
Packet Level		NCTWORK LEVEL	
Character Level		Link Level	[reset] [link enable]
Exchange Level	[reset], [link enable], [autostart]		[autostart]
Signal Level	[link speed]	Signal Level	[link speed]
Physical Level	Management	Physical Level	Management

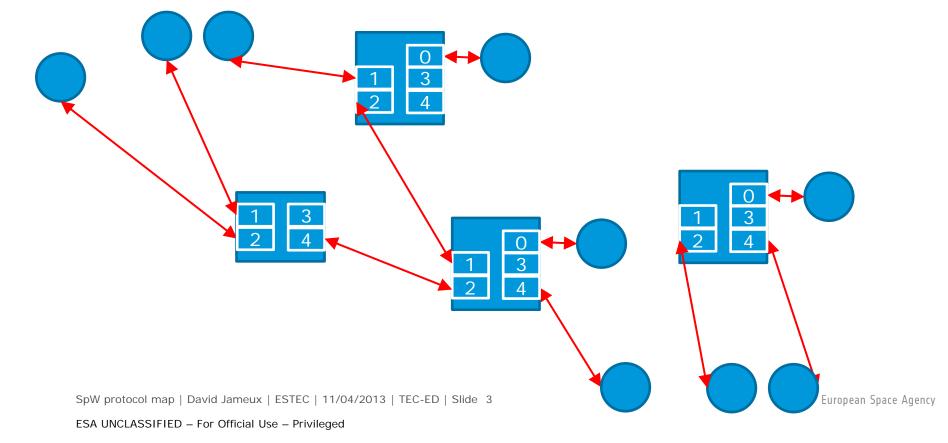
SpW protocol map | David Jameux | ESTEC | 11/04/2013 | TEC-ED | Slide 2

Need for topology representation



- 1. For (re)configuration
- 2. Nicely supported by network discovery

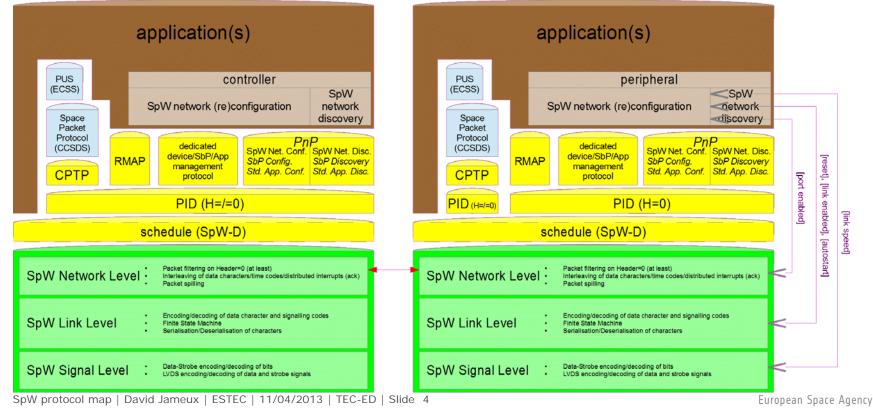




TRP - Network Discovery Protocols (1)



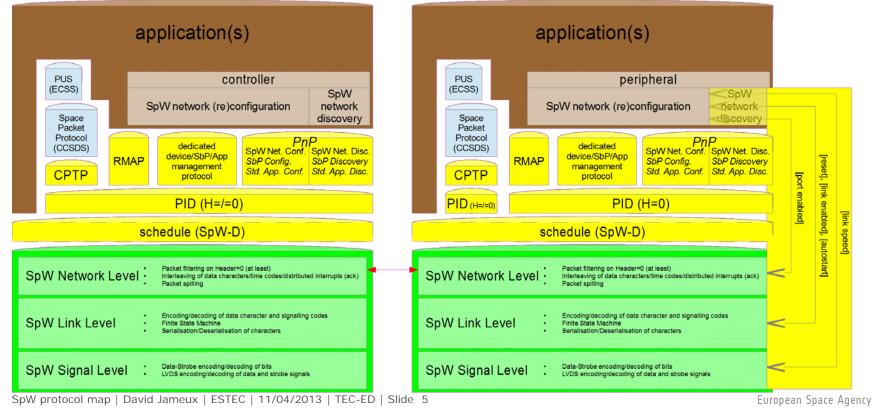
- SpW 1. Target = PnP for SpaceWire -> SpW Net. Discovery + SpW (device) Configuration
- **SbP** 2. Tempting: Discovery and Configuration of SpW-Based Protocols (PnP itself, RMAP, more to come)
- S/C 3. Tempting: discovery and configuration of standard applications (Net. Mgt Service itself, Packet Store, etc.)



TRP - Network Discovery Protocols (2)



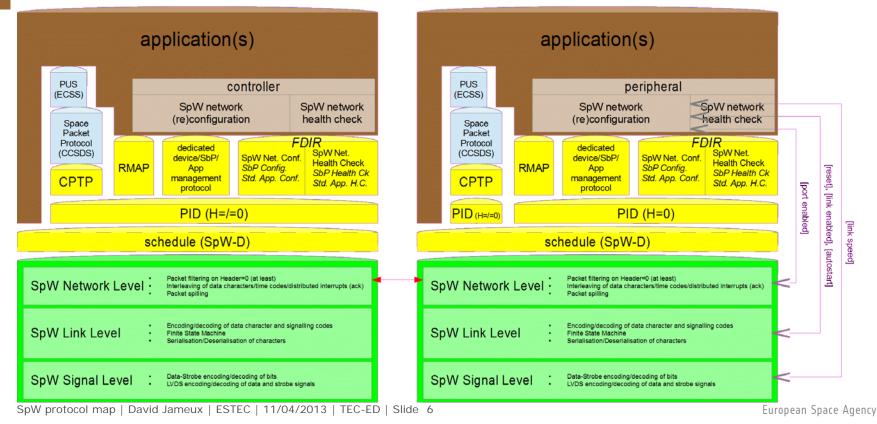
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TRP – FDIR for SpW Networks (1)



- SpW1.Target = FDIR for SpaceWire -> continuous SpW Net. Health Check + SpW
(device) Configuration
- **Shp** 2. Tempting: continuous health check and reconfiguration of SpW-Based Protocols (RMAP, more to come)
 - 3. Tempting: continuous health check and reconfiguration of standard applications (Time Synch Error, Software Error, Node Heartbeat, Node Boot Fail, Node Reset)

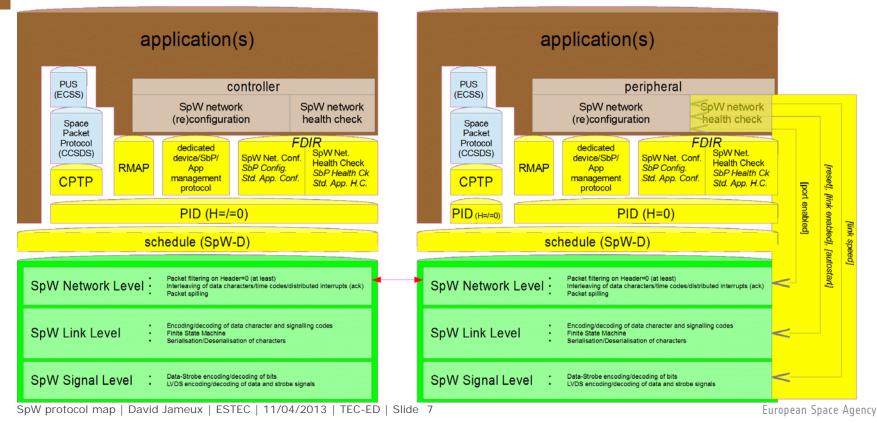


S/C

TRP – FDIR for SpW Networks (2)



- SpW1.Target = FDIR for SpaceWire -> continuous SpW Net. Health Check + SpW
(device) Configuration
- **Shp** 2. Tempting: continuous health check and reconfiguration of SpW-Based Protocols (RMAP, more to come)
 - 3. Tempting: continuous health check and reconfiguration of standard applications (Time Synch Error, Software Error, Node Heartbeat, Node Boot Fail, Node Reset)



S/C

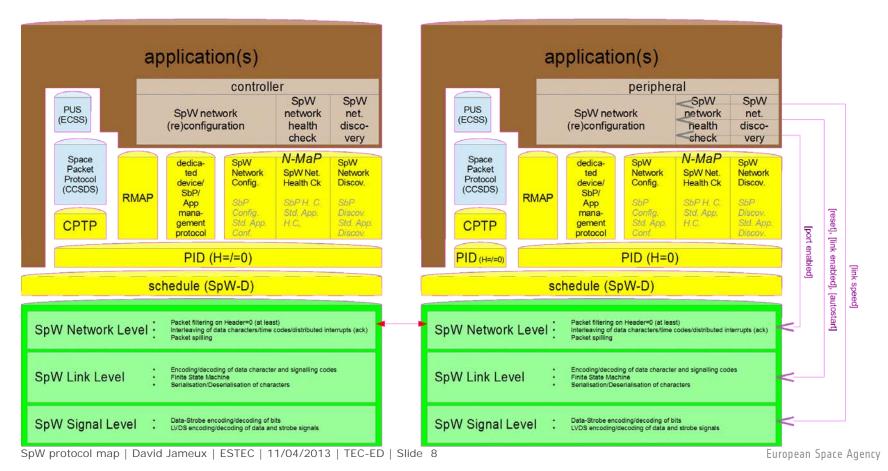
TRP/GSTP convergence activity SpW Network Management Service Suite (SpW N-MaSS) (1)



SpW

1.

Target 1 = PnP + FDIR for SpaceWire -> SpW Net. Discovery + continuous SpW Net. Health Check + SpW (device) Configuration

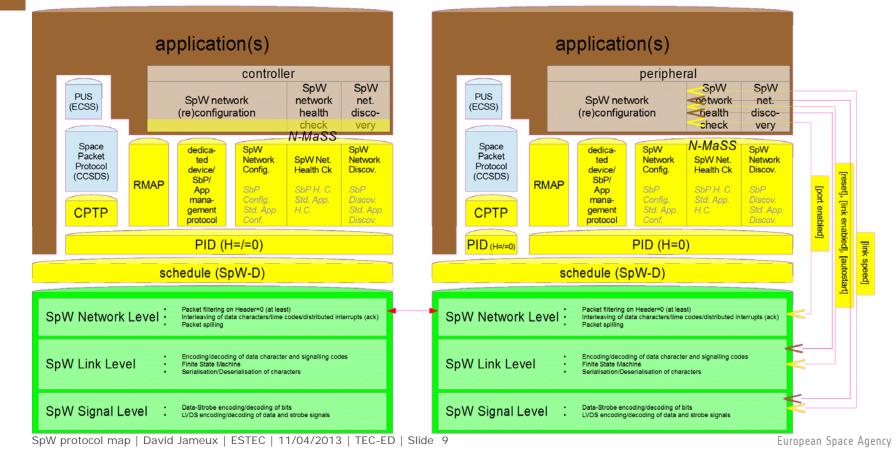


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TRP/GSTP convergence activity SpW Network Management Service Suite (SpW N-MaSS)(2)

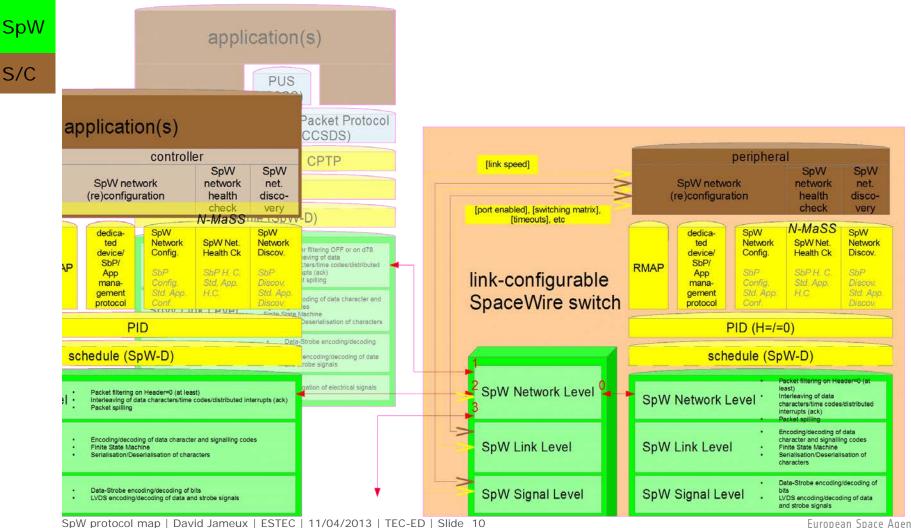


- SpW1.Target 1 = PnP + FDIR for SpaceWire -> SpW Net. Discovery + continuous SpWNet. Health Check + SpW (device) Configuration
- S/C 2. Target 2 = standardisation of management interfaces and services



TRP/GSTP convergence activity SpW Network Management Service Suite (SpW N-MaSS)(3)





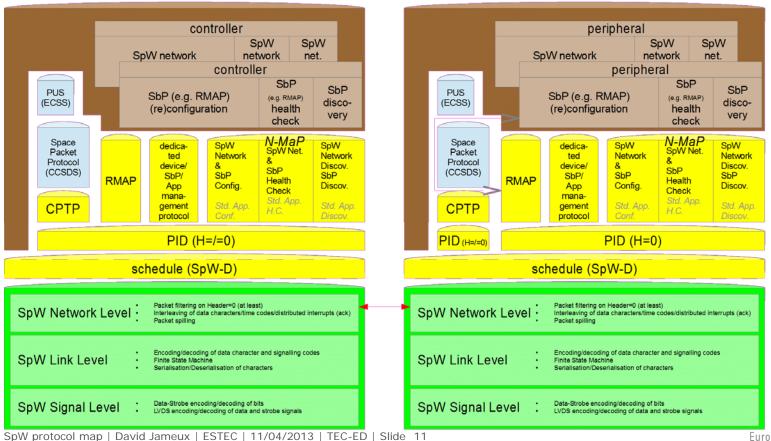
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TRP/GSTP convergence activity Management Service Suite for SpW & SpW-based Protocols (N-MaSS/X) (1)



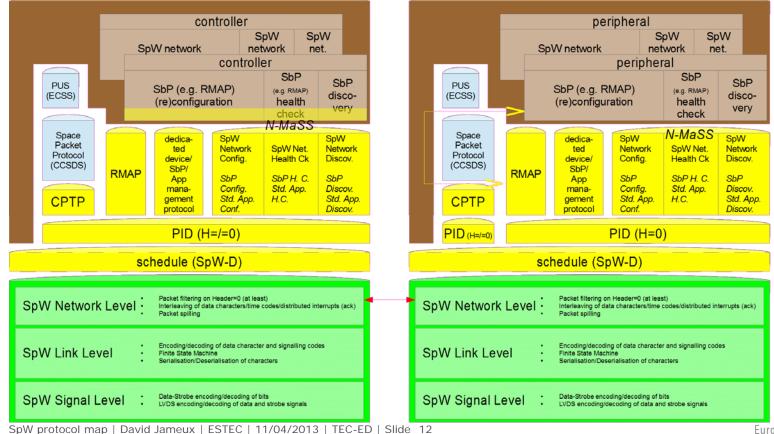
- **SpW** 1. Target 1 = PnP + FDIR for SpaceWire
- SbP 2. Target 2 = PnP + FDIR for SpaceWire-based Protocols



TRP/GSTP convergence activity Management Service Suite for SpW & SpW-based Protocols (N-MaSS/X) (2)



- **SpW** 1. Target 1 = PnP + FDIR for SpaceWire
- SbP 2. Target 2 = PnP + FDIR for SpaceWire-based Protocols
- S/C 3. Target 3 = standardisation of management interfaces and services



Conclusion



- 1. Network Discovery Protocols
 - a. TRP 200k€ <u>SciSys</u> + STARDundee
 - Draft "SpW PnP" protocol spec (ECSS-like) March 2013 -> end of 2013
- 2. FDIR for SpW Networks
 - a. TRP 250k€ <u>Astrium UK</u> + 4Links + Teletel
 - Draft "SpW FDIR" protocol spec (ECSS-like) April 2013 early 2014
- 3. TRP/GSTP convergence activity
 - a. "Management Service Suite for SpW & SpW-based Protocols (N-MaSS)"
 - Possibly extended to SbPs and standard applications
 - b. Contact your delegations for financial support
 - system (prime) + SW/protocol design + board/FPGA prototyping

SpW protocol map | David Jameux | ESTEC | 11/04/2013 | TEC-ED | Slide 13