



# **Proposal for Defining Standard Services Over SpaceWire**

**- Revision A -**

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# Purpose of This Presentation

- ❖ This presentation proposes defining standard communications services over SpaceWire.
- ❖ Each standard communications service is provided by a combination of SpaceWire protocols for the applications on the hosts.
- ❖ For each service, a standard API or a formal service definition should be specified.
- ❖ Definitions of standard communications services facilitate separation between applications and SpaceWire protocols and help the applications developers concentrate on the design of the applications.



# Standard Communications Services

- ❖ For defining services, those defined in the CCSDS Green/Magenta Books on Spacecraft Onboard Interface Services can be used as the starting point, and we should create a version customized for SpaceWire.
- ❖ Furthermore, the functionality of each protocol in the SpaceWire protocol stack should be defined in terms of its relationship with the other protocols in the stack.
- ❖ A document that shows the overall structure of SpaceWire protocols and services should be developed and published. It should be called “SpaceWire Architecture” or something.



# Standard Services (Examples)

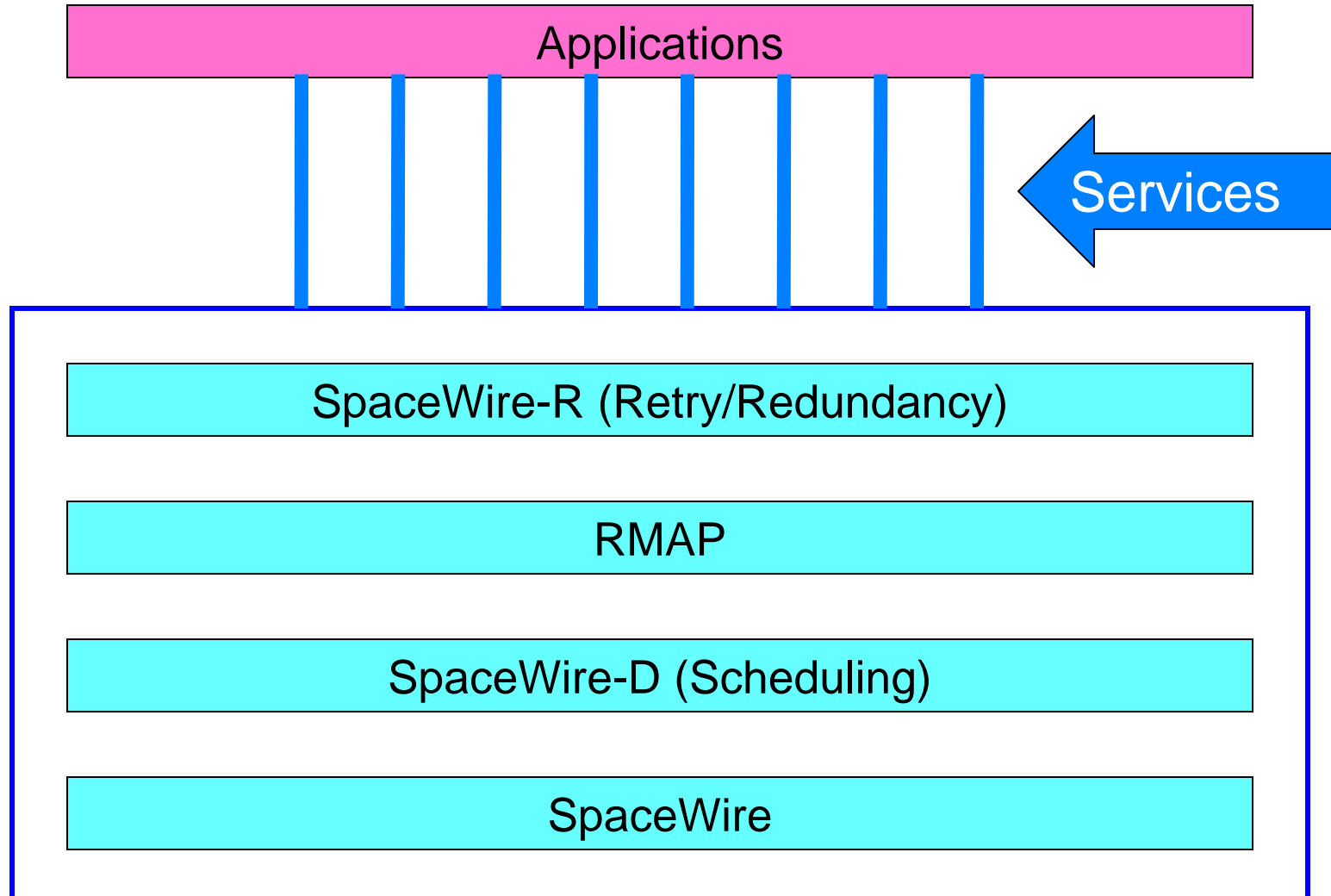
- ❖ Packet Services
  - Best Effort Packet Service
  - Assured Packet Service
  - Reserved Packet Service
  - Guaranteed Packet Service
- ❖ Memory Access Services
  - Best Effort Read/Write Service
  - Assured Read/Write Service
  - Reserved Read/Write Service
  - Guaranteed Read/Write Service



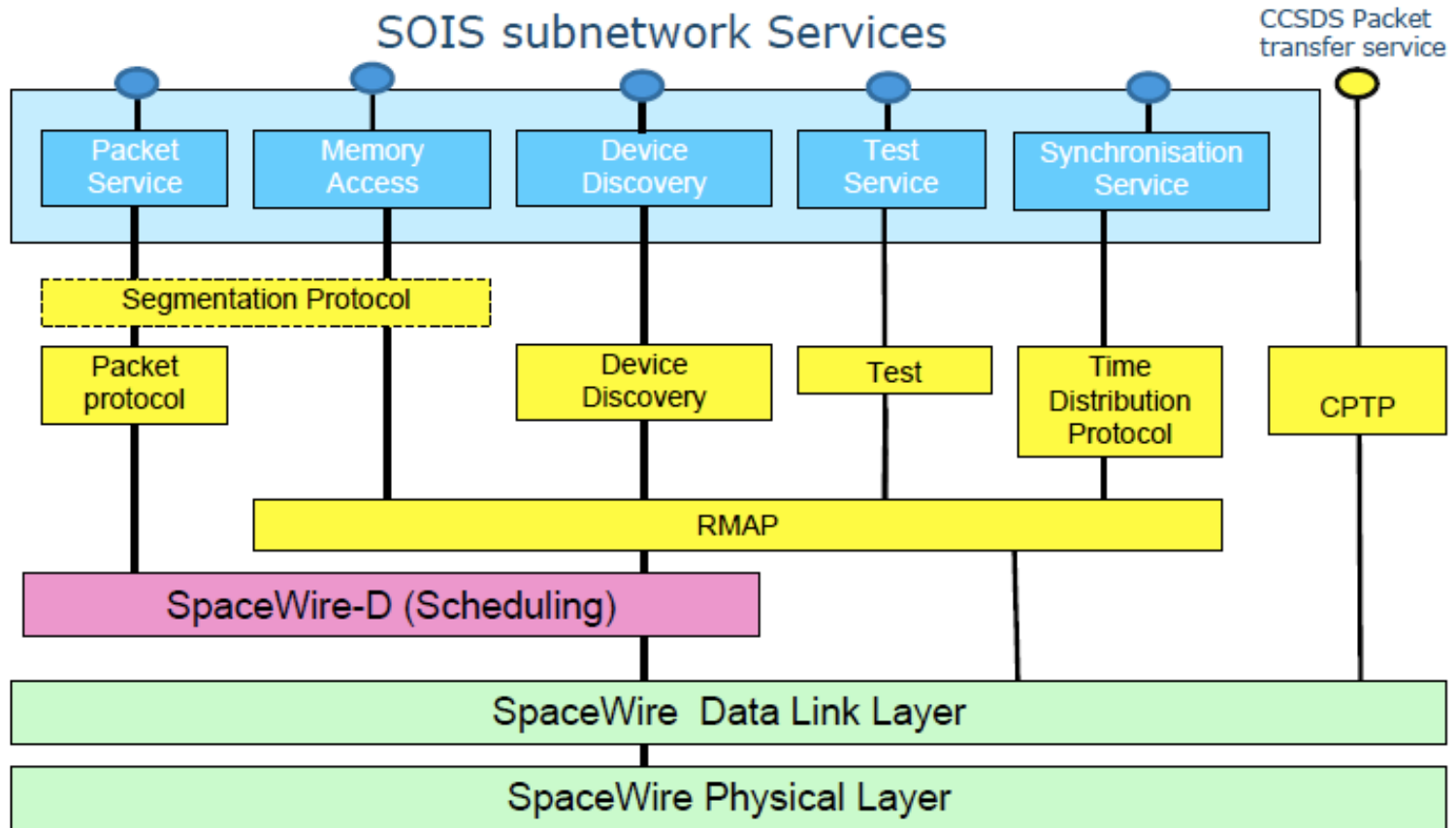
# Protocols Providing Services (Examples)

- ❖ SpaceWire-R
  - Provides reliable data transfer without loss, without duplication, and in-sequence
  - Optionally provides capability for managing redundant routes
- ❖ Remote Memory Access Protocol (RMAP)
  - Provides capabilities for reading data from and writing data into remote memories
- ❖ SpaceWire-D
  - Provides timely access to data links
- ❖ SpaceWire
  - Provides capabilities for sending and receiving data

# Services and Protocols



# QoS is Missing



- ❖ This diagram does not show how different QoS classes are provided.

# Mapping Between Protocols and Services

## (Examples)



	Packet Services				Memory Access Services			
	BE	A	R	G	BE	A	R	G
SpaceWire-R		X		X		X		X
RMAP					X	X	X	X
SpaceWire-D			X	X			X	X
SpaceWire	X	X	X	X	X	X	X	X