Results of Analysis for the SpW-D Draft Specification

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Purpose of This Presentation

- This presentation shows the results of the analysis for the SpaceWire-D draft specification (Draft B) prepared by University of Dundee.

General

- The draft specification specifies what needs to be specified very clearly.
- The functions provided by the protocol are exactly what we require.
- We only have some comments, which are described in the following slides.

Number of Transactions Per Time-Slot

- In the draft specification (3.5.1 b), only one RMAP transaction is allowed in a time-slot.
- We think how many transactions should be allowed in a time-slot changes with the requirements of the network.
- For example, to do something with a series of RMAP transactions, a group of time slots must be allocated for this purpose. However, it might be easier to manage time-slots if multiple transactions were permitted in a time-slot. Of course, time-slots must be long enough to accommodate multiple transactions per slot.
- We think the number of transactions allowed in a time-slot, together with the selection of time-slot length (or equivalently the selection of epoch interval), should be determined by the network based on their requirements on latency and time-slot management.

Schedule Table

- In the draft specification (3.5.1, 3.5.2, and 3.5.3), three schemes (Simple, Concurrent and Multi-slot Schedules) are defined, and a schedule table is defined for each of the schemes.
- We think the format and contents of the schedule tables should be standardized and it would be easier if a single format were used for all of the schemes.
- We propose using something like the table shown on the next slide as the single standard schedule table for the Simple, Concurrent and Multi-slot Schedules.

Standard Schedule Table (Example)

Time-slot	0	1	2	3		63
Initiator 41	42	44, 45	46, 47	48, 49		44, 46, 48
Initiator 42	None	43	44			45
….						

- The entries in each box indicate the targets to which the initiator is allowed to send RMAP commands.

Maximum Data Length

- In the draft specification (3.8.1), the maximum data length is specified to be 256 bytes (if multi-slot schedule is not used).
- If a network needs to transfer long data units (like images), many slots must be allocated and segmentation must be performed. This is not very convenient for networks used for collecting science data from science instruments (for example). Of course, time-slots must be long enough to accommodate long data units.
- We think the maximum data length allowed in a time-slot, together with the selection of time-slot length (or equivalently the selection of epoch interval), should be determined for each network based on their requirements on data length and time-slot management.

Protocol Stack 1

- In Figures 5-1 and 5-2 of the draft specification, it is not clear what each box represents.
- We think SpaceWire-D should be the protocol used for scheduling the SpaceWire network, and another protocol (for example, SpaceWire-R) should be defined for Retry/Redundancy.
- The entire protocol stack should look like the one on the next slide.

Protocol Stack 2