CCSDS SLS-SLP WG Meeting Minutes

Final Spring 2021 Virtual Meeting

May 17-18, 2021

7 AM – 9 AM PDT

1. Attendees: Gian Paolo Calzolari (ESA), Greg Kazz (NASA), Marco Rovatti (ESA), Matt Cosby (UKSA), Christian Stangle (DLR), Amanuel Geda (DLR), Victor Sank (NASA), Gilles Moury (CNES), Brent Andres (NASA), John Pietrus (NASA), Lee Pitts (NASA)
2. The SLP WG meet over these two days focused exclusively to disposition agency RIDs against the pink sheet review of AOS, TM, TC, and USLP SDLPs. The detailed disposition of these RIDs are to be found on the SLP WG CWE site at: <https://cwe.ccsds.org/sls/docs/Forms/AllItems.aspx?RootFolder=%2Fsls%2Fdocs%2FSLS%2DSLP%2FMeeting%20Materials%2F2021%2FSpring&View=%7BAE8FB44C%2DE80A%2D42CF%2D8558%2DFB495ABB675F%7D&>
3. All RIDs were resolved at the meeting. Specifically, those RIDs submitted by agency are:

**USLP RIDs (21 Total)**

* 1. 20from NASA
     1. 15 John Pietrus concerning USLP Blue Book
     2. 1 Ken Andrews (identical in AOS, TM) for OID Frame Randomization procedure
     3. 3 David Ni – USLP Blue Book
     4. 1 Craig Biggerstaff – truncated transfer frames using SDLS Security Association
  2. 1 from ESA – Holgar Dreihahn – USLP’s use of Variable Length frames on the downlink affecting Cross Support Services.

**TC RIDs (1)**

NASA RID in Word file concerning Update to Figure 6-3 (collaboration between SLP & SDLS WGs) in TC (232.0-B), addition of send and receive side tables describing figure 6-3 as well as inclusion of Frame Initialization and Finalization Procedures with respect to Figure 6-3.

Note: SLP WG consensus was achieved that the nature of these changes to 232.0-B do not require a separate agency review of this material, since they are clarifications of these existing sections in the blue book. Indeed, these clarifications provide a finer level of detail such as e.g., the fact that the COP passes the modified Frame Sequence Count to the TC SDLP in the Frame Finalization Procedure. An updated draft of the TC Space Data Link protocol blue book containing all of the above listed changes will be produced and provided to both the SLP and SDLP WGs for final review before publication.

During the meeting, it was also confirmed that both the Frame Status Report (FSR) provided by SDLS protocol as well as the CLCW generated by the COP-1 are optional features which is correctly captured by the new end-to-end figure replacing figure 6-3 in 232.0. However, it is also true that it is better to utilize these reporting mechanisms than to have missions generate their own ad-hoc reporting mechanisms.

**AOS RIDs (1)**

1. 1 from NASA – (Ken Andrews) – same as above for USLP

**TM RIDs (3)**

1. 1 from NASA (Ken Andrews) – same as above for USLP
2. 2 from ESA (Felix Flange) – remove some ambiguity in the text concerning TFVN
3. Discussion and follow up associated with OID Frame Randomization pattern generated by newly proposed LFSR procedure.

The SLP WG concluded to include both the Fibonacci as well as the Galois versions of the LFSR figures provided by the C&S WG into a new non-normative (informative only) Annex. In addition, the normative text to be added to Section 4 of the TM, AOS, and USLP blue books is:

The Transfer Frame Data Field of an OID Transfer Frame shall be filled in by the mandatory Pseudo Noise (PN) sequence generated by use of the 32-cell Linear Feedback Shift Register (LFSR) with polynomial D0 + D1 + D2 + D22 + D32.

NOTE – Annex TBD contains example implementations of this LFSR.

Following the precedent set with the CRC annex containing normative clauses for polynomials and non-normative NOTES for the implementation diagrams within the Space Data Link Protocol Blue books, the SLP WG also decided to use the same approach for these implementation specific diagrams.

The implementation specific initialization seed values as well as the first 10 bytes of the output of the LFSR will be contained in the non-normative Annex. Therefore, a new informative Annex C will be created for TM and AOS as well as Annex H in USLP.

A follow up with Ken Andrews of the C&S WG occurred after the meeting, who answered our SLP WG questions after the meeting, since he couldn’t attend. This information is documented in emails sent by Ken to the SLP WG chair and is available upon request.

1. Current Status of Draft SLS Glossary of Terms Magenta book – given the additional work on USLP, this Project’s status is the same. There exists a list of terms distributed to the SLP WG which contains all of the multiple possibilities associated with the key terms for the SLS area. Next step is to narrow the list down to the chosen terms given all the potential alternatives (note – some terms are clear cut and have only one option, others have multiple) and once completed, provide this recommendation to all WGs of SLS area, so that consensus can be achieved at the area level (involving telecoms and joint meetings).
2. Current Status of SPP/EPP Green Book – No further progress has been made here due to the other topics above which have taken priority. A draft SPP GB does exist but there was never an Encapsulation Service GB, so a combined SPP/EPP will take up to two additional meeting cycles to complete.
3. Resolutions agreed at this meeting are:

* Publish Issue 2 of CCSDS 732.1-B USLP
* Publish Issue 4 of CCSDS 232.0-B TC SDLP
* Publish Issue 3 of CCSDS 132.0-B TM SDLP
* Publish Issue 4 for CCSDS 732.0-B AOS SDLP

This meeting will be the last one at which Gian Paolo Calzolari will be our SLS Area director. The SLP WG thanks Gian Paolo for his outstanding support and due diligence to our WG throughout the many years of his leadership in CCSDS. We wish him and his family the best of luck as he transitions to an enhanced form of freedom and decreased entropy. Most likely, Mr. Ignacio Aguilar Sanchez will serve as the next SLS Area Director. Ignacio joined ESA in 1991 in the Directorate of Technology (D/TEC) and has developed a unique expertise in the area of Space Communications and Space Link Protocols.

1. Next meetings – the Fall 2021 meetings are scheduled to be held in Toulouse, FR from Oct. 18 to Oct. 22, 2021. Please see <https://public.ccsds.org/meetings/default.aspx> for more details as they appear. However, due to the COVID-19 pandemic, that may change. Please stay tuned to the CCSDS website for updates.

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