CCSDS SLS-SLP WG Meeting Minutes

Spring 2023 Meeting (Huntville, AL, USA)

May 8-9, 2023

Final Version

1. *Attendees*: Ignacio Aguilar-Sanchez (ESA), Greg Kazz (NASA), Matt Cosby (UKSA), Stefan Veit (DLR), Amanuel Geda (DLR), Gilles Moury (CNES), Ken Andrews (NASA-JPL), Victor Sank (NASA), Johnathan Jackson (NASA), Kevan Moore (NASA), Stuart Golden (NASA), Faramaz Davarian (NASA),

All the files mentioned in these meeting minutes can be found on the SLP WG CWE under the following URL:

1. *Addition of a new composite Supervisory Protocol Data Unit (SPDU) to Proximity-1 Blue Book (CCSDS 211.0-B-6) Annex B*

The chairman, Greg Kazz, spoke to the white paper, “Proximity-1 Directives for S, Ka, and Optical bands”, which contains the initial inputs towards creating directives (i.e., commands) to be proposed as the next generation Proximity-1 directive set for lunar operations. Realizing that additional proximity-1 comm parameters need to be added for Lunar comm, this white paper examined ways of best accommodating the new lunar comm. requirements. This white paper can be found in the SLP CWE directory at this URL: <https://cwe.ccsds.org/sls/docs/Forms/AllItems.aspx?RootFolder=%2Fsls%2Fdocs%2FSLS%2DSLP%2FMeeting%20Materials%2F2023%2FSpring%2FProximity%2D1%20Lunar%20Operations&FolderCTID=0x012000439B56FF51847E41B5728F9730D7B55F&View=%7BAE8FB44C%2DE80A%2D42CF%2D8558%2DFB495ABB675F%7D>

Previous to this meeting as well as at this meeting, Stuart Golden, Chief Technical Officer for Vulcan Wireless, a US company involved in producing the proximity radio for the lander component of the Lunar Pathfinder mission, presented his approach to add a new composite SPDU directive, utilizing the existing SPDU formats. Please see the previous URL above for Stuart’s presenation: “SG\_slides\_CCSDS\_submission”. In summary, Stuart suggested the SLP WG adopt the DVBS2 MODCOD approach of defining one parameter using a single value to convey the information about i) encoding, ii) modulation, and iii) link layer protocol. Furthermore, the specific frequency as well as the specific data rate, as single precission 32 bit IEEE floating point numbers be used instead of the current tablular channel approach used as the type 1 SPDUs, currently used at Mars. The SLP WG were in agreement that Stuart’s approach had merit and consensus was achieved that the SPDU type 3 would be used to define this new composite directive type. The white paper above contains a draft specification of how this new composite SPDU Type 3 would appear in an updated version of Prox-1 Annex B. What is missing, is the actual definition and value assignments of the MODCOD field. We believe this field will be defined by both the RF&MOD and C&S WGs.

Note that there is already an existing project in the framework for this SLP WG activity. It is called, *Augmenting Proximity-1 directive set for Lunar Operations.*

**ACTION-1-2023-5-09:** On Greg Kazz

Work with the C&S WG and RF&MOD WG to capture their parameters to populate this new type 3 SPDU directive. Due Date: Oct. 30, 2023

1. *Addition of the default session access control parameters for space enterprises to a new normative Annex in the Proximity-1 Blue Book (CCSDS 211.0-B-6)*

CCSDS has never documented the default session access control parameters for the Mars Enterprise. These default parameters enable link establishment (hailing) as well as transferring to a working channel for data services operations. At JPL at least, it was realized that CCSDS could help the missions by documenting this default set for a given Enterprise. Now that we are going back to the moon, another Enterprise has been added, Lunar. Ergo, the SLP WG chair proposed to create a NASA Orange book to document these default parameters for proximity operations. The orange book approach was created to expedit the need for the new lunar missions. However, as it turns out, the SLP WG consensus was not to create a new Orange book, but rather to utilize the existing project, “*Augmenting Proximity-1 directive set for Lunar Operations”* to create a new normative Annex in Proximity-1 211.0-B document to contain this information.In that way both the default values as well as the actual parameter set will reside in the same document.

**ACTION-2-2023-5-09:** On Greg Kazz

During the meeting, we walked through the managed parameters in 211.0-B-6 associated with hailing (link est.) and moving onto a working channel. There are several other candidate default parameters that will be added to this new annex to be reviewed and approved by the SLP WG before the Fall meeting 2023. Due Date: Oct. 30, 2023

1. Decompose *Prox-1* (CCSDS 211.0-B) into 3 separate books, two of which would be new as a “though experiment” or feasibility study.

Lunar Pathfinder is planning to use USLP instead of the Version-3 Proximity-1 transfer frame format. This is great news for progressing CCSDS standards, but it creates some confusion for the implementors. Prox-1 is unique in that in contains the COP-P reliable sequence control procedure, Message Access Control (hailing, frequence and data rate change capability) and the PDU definition (transfer frame format). All other CCSDS link layer specification only define the PDU, along with the services and service primitives. Therefore, it seems to make sense to break up the existing Prox-1 data link layer book into those 3 components.

**ACTION-3-2023-5-09:** On Greg Kazz

As a feasibility study, Greg will break the Prox-1 Space Data Link Protocol book into those 3 component parts, to see how difficult or easy it is to do so. He will share his results with the SLP WG before the Fall 2023 meeting. Concurrently, Greg will work with Ignacio (SLS area director) and Peter Shames (SE AD) to gain insight from their expertise and opinions on the way forward from a CCSDS management point of view.

1. Two resolutions were requested as a result this meeting:
   1. SLP WG requests that the CCSDS send the attached draft USLP document (CCSDS 732.1-B) to the CCSDS Secretariat, so that it can be prepared for Agency Review as the draft 3.0 USLP blue book.
   2. SLP WG requests that the CCSDS generate a Technical Corrigendum to CCSDS 232.0-B (TC SDLP) identified by the Red Bars in Section 6.5.2 to reorganize Section 6.5.2 (Order of processing Between TC, COP-1, and SDLS protocols) plus add 1 NOTE in that section. (pending final conclusion by Tom Gannett)
2. Next planned meeting– the Fall 2023 technical meetings are scheduled to be held in the Hague, the Netherlands from November 6 – 10, 2023. Please see <https://public.ccsds.org/meetings/default.aspx> for more details as they appear.

END