CCSDS SLS-SLP WG Meeting Minutes

Fall 2020 Virtual Meeting

Oct 26-27, 2020

7 AM – 9 AM PDT

1. Attendees: Gian Paolo Calzolari (ESA), Greg Kazz (NASA), Massimo Bertinelli (ESA), Matt Cosby (UKSA), Christian Stangle (DLR), Stephan Veit (DLR), Amanuel Geda (DLR), Tomasso DeCola (DLR), Guray Acar (ESA), Gilles Moury (CNES)
2. AD/BC Services affecting USLP – presentation by Matt Cosby. Uploaded to CWE under<https://tinyurl.com/y3wasu8p>. The WG came to consensus on Matt’s recommendations for sticking with the terms used in COP-1 for AD/BC Services and associated frames. Those sections of USLP particularly in Section 2 and 4 we updated in the draft blue book to reflect those recommendations. These changes will become a part of the new draft SLP WG project towards issuing a Version 2 USLP Blue and Green book.
3. Five year review of AOS, TM SDLPs. Our SLP WG has been accumulating changes to these two documents which had been discussed and agreed to during previous WG meetings. In addition, Gilles Moury presented a slight update to the SDLS FSR portions of both AOS and TM SDLPs. The WG agreed largely with Gilles’ updates and the modifications that were agreed to are contained at: [**https://tinyurl.com/y68opdsx**](https://tinyurl.com/y68opdsx)which represents the current WG versions of both documents.
4. Systematic Retransmission sections in TC SDLP and COP-1. The result of this discussion was for Gian Paolo Calzolari to take the action to generate pink sheets in TC SDLP with the actual agreed upon changes. As it turned out, changes have already been made to the COP-1 as published on the CCSDS website. Thanks to Gian Paolo for the quick response to his action item. Please see the two files dated 10/27/2020 at the URL below. The PDF file only contains the changes. The Word file contains the changes in the context of the entire TC SDLP document. These files are contained at: [**https://tinyurl.com/yxkfe4wj**](https://tinyurl.com/yxkfe4wj)
5. Proposal to simplify USLP FECF in CCSDS 732.1-B and 700.1-G. This item was discussed in the context of all the proposed changes to the USLP blue book. Basically, only the 16-bit CRC would apply to the USLP FECF, since the 32-bit variant is defined within the PLTU of the Prox-1 Sync&CC specification and is mandatory for that interface. The WG concurred with this change. See the “All changes USLP” document with 10/30/2020 in it for the FECF section in number 6 below.
6. Review latest updates USLP BB kept for safe keeping for later action on MC\_OCF service, ambiguities with fixed vs variable length frames, truncated frame, I/F TC Sync & CC. We had a very good discussion of the proposed changes in the proposed updated USLP BB. The two remaining topics are under discussion after this meeting: a) how USLP interfaces to the COPs and b) if an SDLS Security Trailer will be a mandatory field for the truncated USLP transfer frame. Please see the file name with 10/30/2020 in it: [**https://tinyurl.com/yxlkgy95**](https://tinyurl.com/yxlkgy95)
7. 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 of SLS area, so that consensus can be achieved at the area level (involving telecoms and joint meetings).
8. 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 a bit more time to complete.
9. Action items –
   1. Gilles Moury will review the SDLS Frame Status Report (FSR) text in the USLP BB (Section 4.1.5 OCF) to ensure it is consistent with the similar text provided for both the AOS and TM SDLP books as a result of the 5-year review concluded today. (Greg Kazz will load the TM and AOS SDLP updated books to the CWE today)
   2. Gian Paolo will take the COP-1 and TC SDLP proposed changes discussed at the meeting today and integrate those changes into pink sheets for the COP-1 as well as the TC SDLP blue books. These pink sheets will facilitate the review by the SLP WG off-line. \*\*completed \*\*
   3. Matt Cosby will create a table showing under what conditions COP-1 and/or COP-P apply for USLP. Both forward (command) and return (telemetry) links will be described. \*\* proposal provided, now under review to be released shortly \*\*
   4. Gilles Moury to add Agenda Item to the SDLS WG meeting for this Wed. to discuss accommodating SDLS security (SDLS header/trailer) for USLP truncated transfer frames, by adding an additional baseline mode for it.  Can 16 octet Security trailer be shortened by using a shorter MAC ? \*\* completed, email documenting SLDS WG response follows below \*\*
10. Response from SDLS WG (send on 10/28/2020 by Gilles Moury) on applicability of SDLS to USLP truncated frame:
    1. USLP truncated transfer frames are meant to be used for sending short commands (as short as 2 octets) to the spacecraft. Those short commands are typically hardware commands (bypassing OBSW) or immediate commands (triggering on-board procedures/sequences). Those commands are not necessarily emergency commands. They can be used during normal operations also. They are critical commands. Therefore, it is desirable that they can benefit from SDLS security protection;
    2. SDLS minimum overhead (corresponding to TC baseline mode) is : Security Header (6 octets), Security Trailer – MAC (16 octets). This minimum overhead means that SDLS protection as is , is only applicable to truncated frames fitting into 1 LDPC(256,512) codeblock (32 octet) : Frame header (5 octets), Sec Hdr (6 oct), MAC (16 oct), leaving 5 octet maximum for the command itself. If BCH is used on the link, using SDLS would require several codeblocks per frame (at least 5). This can be acceptable, possibly even for emergency commands (e.g. tumbling spacecraft);
    3. Reducing the overhead of SDLS would imply reducing the level of security provided by the protocol and taking into account additional constraints (number of key invocations, number of forged attempts, …). For example, MAC could be truncated to 64-bit (minimum length with AES) and the Sec Hdr could be reduced to 4 octet (with a reduced anti-replay counter). Nevertheless, the WG concluded that it was not advisable to design an SDLS “reduced overhead” baseline mode for this USLP truncated frame mode, because recommending a reduced security mode for critical commands is not appropriate for a standard.
    4. Clear mode implementation is always an option for a given mission, although not recommended security-wise, whenever operational safety or link constraints requires it.
11. Next meetings – Most likely the Spring 2021 meetings will be conducted virtually. Stay tuned.

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