**CCSDS Engineering Steering Group (CESG)**

**Fall 2018 Meeting: Monday, 22nd October 2018, DIN, Berlin**

**Attendees: MdG, BB, WT, PS, SB, JW, GM, MM, GPC, TG, TdC, EB, CH, XE**

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| **CESG Discussion on SLS Area Issues** **from the past week**Slide 7: Telemetry ranging standard will reside in 410.0-B (2.4.24). Erik Barkley raised the question about its counterpart for the uplink ranging direction. Gian Paolo Calzolari clarified that a proposal for telecommand ranging was presented but further investigation is needed because it was noted that telecommands may be sporadic and mixed with idle sequences and - in addition - the frame counter field does not increase regularly and a given value can repeat itself (e.g. due to sequence controlled service or “repetition“ technique) while frames using the expedited service do not update the value in that field.Slide 8: AOS uplink (USLP uplink) coding: The agreement by the C&S working group is to produce first a single concept paper that will address 4 CWE projects to address a) and b) below. 1. the working group will start a project to write an “application profiles” book to specify the subset of TM codes allowed for uplink of fixed length frames. Combinations of codes and protocols may be addressed too.
2. Harmonize the 3 coding books (TM, SCCC, DVB-S2) to correctly address fixed length frames uplink, USLP additions, etc. Most likely the title of the TM coding book will be changed to remove the acronym TM that may cause misinterpretation of the subject.

The four projects are planned to start in parallel. SEA AD commented that the introduction of this new document, and this prioritization which puts the new document first, and adds DVB and SCCC, could have the really negative effect of delaying the development of uplink coding for AOS, which is required by the LOP-G comm architecture.Slide 12: Removal of Space Packet from Encapsulation Service: The removal simplifies the interface for using either Space Packets (SPs) or Encapsulation Packets (EPs). Both EP and SP can still be used to encapsulate protocol data units from upper layers protocols, but for SP the APID values used will be mission-managed with no reserved APID values. The CESG agrees that the term “service” used in the book title is not accurate, because what actually defined in this book is a “shim” which in fact is a very simple protocol.USLP blue book publication approved by the CMC. It will be published any moment.Slide 17: Lossless data compression – To support the creation of file format for the compressed data in a standard fashion, add an optional header structure to produce output as a file. Metadata in the header. At present, the standard use the space packet grouping flags to tie up all packets.Slide 20: HPE C&S layer BB Agency Review completed. – OPT WG Coding and Physical layer books for High Photon Efficiency (HPE) Scenario ready but waiting for prototype to be completed. SLS-OPT is now going to address a low complexity approach named Optical On/Off Keying (O3K). Peter Shames reported the C&S layer violation contained in the JAXA proposal addressing creation/usage of Ethernet Compatible Frames as the Space Data Link layer. However, now the WG has consensus only for the Optical communications physical layer BB to include O3K in Issue 2. This is a new CWE project.Slide 33: “New policy on glossary” is changed to “Policy on glossary” since PS states that the policy has been in place for some time, in both the Procedures Yellow Book and, in more detail, in the Registry Management Policy published in 2016. The WGs will have to review the policy itself and fix their glossary entries at the 5-year cycle revision cycle, if not sooner. All working groups will be reminded of the following: (a) for new books in work, ensure the correct definition of terms and re-use terms already present in CCSDS Glossary; (b) for books already published, at the 5-year revision cycle, check the use of terms against glossary and make necessary updates- **CESG Discussion on SOIS Area Issues from the past week**Significant number of new participants from CNSA. Slide 4: CAST presented software architecture use cases. LOP-G progress by using SOIS EDS for avionic software implementation. Extension of SPP name space secondary header. A concept paper started on this (but not yet provided to SLS Area). Proposes the use of the secondary header of SPP for a NASA use case (LOP-G) – following the format, but not necessarily standardizing the contents and semantics. It is proposed to register the secondary header extension in SANA registries. CNSA: suggest the use of secondary header version number to keep track the different secondary headers used/defined by a project. SLS AD reminded that it can be expected that ESA will object to any proposal that would make illegal the “PUS Header” flavor of the Packet Secondary Header.Yellow book for the SMC MAL-SOIS EDS relationships: SEA-SA Working Group (SAWG) will review the RIDs (Poll conditions) raised by MOIMS to the Yellow Book and propose a path to resolution. Two EDS-based implementations for flight software: CNSA and NASA (all documented in orange books).Slide 7: SOIS Wireless – is an orange book on the specific use of LTE. No plan for moving toward blue book.Slide 9: Roscosmos’ SpaceWire (SpW) STP-ISS transport protocol: not CCSDS standard, but need a SpW protocol ID. CAST subnet service presentation.Slide 10: The document schedule table – some end dates are unrealistic, to be reworked. SOIS subnet synchronization service, e.g. GPS time service – how to get time synchronization. Mario suggested the use of MO services.Slide 12: Deterministic subnetworks and data sheets. “Deterministic” is to mean the transfer and delivery of packets at deterministic time or timing (rate). Slide 12: SOIS packet store service: Is it a service or application on board? Are these just APIs? Regarding “packet” store, it is to mean the transfer/receive of packets, and put them into a named file. SOIS file store service: management of files, i.e., delete, create, etc. They are now envisioned to be “subnetwork interfaces”. The intention of “packet” approach is to depart from the conventional “frame” store approach. The two service books may be suitable for blue book standards.Slide 12: The use of SEDS is for defining the application and subnet services and to use a toolchain to translate the command and telemetry definitions into PUS or other service interfaces. Adaptor for binding.**CESG Discussion on SIS Area Issues from the past week**Slide 4: On-line Cloud testing – BITTT agreed to this approach along with KARI.Slide 10: DTN – Some SABR capabilities to be placed in informative annex. Will also add some use cases to the informative annex. SBSP: will need a green book. Work more closely with SEA-SEC. SABR and SBSP both will be on track for publication in late 2019. Slide 10: Relations between DTN Network Mgmt and MO services: Network Mgmt is purely a protocol, so binding for MO services may be the solution.Slide 10: The ‘CCSDS Delivery Agent’ standard (as described in the ICPA) for First-Hop / Last-Hop (FHLH) services is becoming increasingly urgent and important. It helps accelerate the infusion of DTN. This has always been defined to be in operation at the last node in a DTN deployment, to handle communications to non-DTN spacecraft, those needing link layer support in off-nominal conditions, and for open loop recording, but it was suggested that one other place for deploying the FHLH is the ground station - it behaves like a spacecraft. But no resource for FHLH is available now. SIS Area proposes that this, or the new bundle security protocol (SBSP), could be worked in a separate working group since the DTN working group is already loaded. SLS AD commented that however it should be checked which experts should work on this as it could happen that two WGs with a large overlap would be created.**CESG Discussion on CSS Area Issues from the past week** CSTS-Tracking BB: prototype delayed to 3/2019.CSTS working group by fall 2019 may have only ESA and NASA participants due to the departure of CNES and DLR.Functional resources are actually a core information model for the CSS Area. The work in this activity is not now in the form of a blue book/magenta book or any book production. It is an internal Technical Note, a different type of product (and effort). WG requests consideration for more dedicated resources and/or consideration for a different type of project.Abstract Event Definition (MB): e.g., navigation group is abstract eventCSS standards development could benefit from CM tool. Need a CCSDS Github or Git. Could host the CM tool server (Git server) at SANA or CWE. Need for maintenance of information asset .**CESG Discussion on MOIMS Area Issues from the past week** Slide 4: Lack of access to ISO webex has been a problem to DAI working group and others. PS commented that the Secretariat is to look into how to handle this.Slide 5: MOIMS asks to approve the DAI resolutions to re-confirm 13 books at the 5-year review cycle. Since most of these books are very old, the CESG agreed the following:* The three books about SFDU Control Authority (630.0-B-1, 631.0-G-2, and 632.0-B-1) need revision to align them with the SANA RMP (Registry Management Policy, CCSDS 313.1-Y-1).
* For the others, the DAI WG shall produce a short justification on their request for “re-confirmation”. This justification will be included in the MOIMS AD resolution to “re-confirm”.

Slide 7: MP&S working group - High momentum. The MOIMS complained since, for the second consecutive meeting in the US, the chair of the MP&S WG (and as a consequence the entire WG) is not allowed to access to the meeting venue because of his birthplace. NOTE: This is due to a US State Department embargo on visitors from certain countries to certain facilities, see (https://www.gpo.gov/fdsys/pkg/CFR-2012-title22-vol1/pdf/CFR-2012-title22-vol1-sec126-1.pdf). A waiver has been sought by NASA, but so far unsuccessfully. As a backup, the Secretariat is looking for a room for a 4-day meeting in 2019 Spring workshop.Slide 9: New Project for revision of the Tracking Data Message v3, the schedule overlaps to some extent with that for the Tracking Data Message v2. This is the result of the pressure put in past years on the NAV WG for the production of CDM that caused the delay of TDM v2. It was the decision of the NAV WG to publish TDM v2 ASAP, despite some changes have been already identified which will be included in v3.Slide 10: The new project for revision of Conjunction Data Message and that for Tracking Data Message: will these all need a concept paper in order to start each project/book? The purpose of concept papers (see CCSDS A02.1-Y-4 section 6.1.3) is to provide a description for the work to be done by the project, so that the CMC could review it for approval/disapproval. That said, an AD could request the CMC to approve the formation of a project without submitting a concept paper. In this scenario, it is up to the CMC to approve the project or request a concept paper before the approval process.*(Note from after the CESG Meeting: about 5-year-review, if this requires only reconfirmation, obviously no concept paper is required.)**<<<I suggest to give an action to the CESG chair to propose a RID to the Procedures YB to improve the text on the requirements for 5-y review. This RID will be implemented at the next opportunity>>>*Slide 13: ESA/JPL “shadow” project – Mars Express emergency support to the Curiosity rover. Overlap between MO services and OMG C2MS.Slide 14: MOIMS resolutions, SM&C-1 and -2, to approve publishing the two books, 524.4 (MO MAL binding to ZMTP Message Transport Protocol BB) and 523.2 (C++ API MB).Slide 17: Liaison rules, responsibilities, and reporting channels – e.g., OMG Liaison reporting should be at CESG meetings, not plenary meetings. How about CCSDS’ liaisons to other organizations of standardization? Will be discussed at the next CESG meeting: the roles of these liaisons and names. Liaison list on CCSDS website is incomplete and inaccurate.Slide 17: SM&C WG non-consensus on CCSDS MO vs. OMG C2MS: DLR/ESA/CNES performed the analysis of the two identifying the overlapping aspects. Non-consensus exists on their paper describing overlapping/complementary nature between NASA and ESA/DLR/CNES. The SM&C chair is viewed by ESA/DLR/CNES as being in a position of conflict of interest. The conclusions:1. Task Dan Smith to produce his analysis of the complementary nature between the MO services and C2MS and how the two capabilities could play together
2. SM&C WG Chair, with the support of selected WG members, shall contact NASA JSC FOD/MCC-21 personnel (Steve Beisert) to promote their adoption of the MO services for Lunar Gateway flight operations.

**CESG Discussion on SEA Area Issues from the past week**Large attendance at the SEA System Architecture working group meeting, including several new CNSA and FSA members.Slide 4. SM&C should consider at the next opportunity the Security WG recommended authentication and key mgmt approach. Same for SIS bundle security.Slide 4: IOAG service catalog – security is almost completely absent (except for SDLS), which seems like an oversight in the current climate. GP commented that the IOAG service catalog does not consider security service as an explicit IOAG service.Slide 5: planning and schedule – end dates not correct, need update (done).Slide 7: MOIMS and SOIS reviewed and agreed to the new Applications and Support Architecture GB materials for the Implementation viewpoint.Slide 7: Side discussion in joint SAWG / MOIMS / SOIS meeting. MOIMS conditions raised on CESG poll for MAL/EDS YB, SOIS has other priorities and no resources to address this. The analysis report is seen as valuable work and ought to be published. The SAWG agreed to analyse inputs and recommend resolution using the “3 deployment cases” as criteria.  Slide 7: Concerns about the SLS Optical O3K Ethernet approach as a space data link protocol replacement – this makes no technical sense for multi-agency interoperability nor space deployment, and it is a layering violation. Gippo: Since the SLS report did not include this item as the input from the Optical WG, the SLS report to the CMC will omit this item too. See also SLS Area reporting part.Slide 10: Delta DOR WG has concerns about the TGFT approach because of its large files. These files are 10-15 GB in size and the WG would prefer to not have to re-write then just to transfer them. Current methods are working fine, but they will evaluate TGFT performance.Slide 11: Plan and schedule of books – incorrect end dates must be updated (done).Slide 12: Time BoF will proceed with the formalization of this BoF activity after a telecon (to be held soon). Depending on interest and resource. P. Shames to send out a MoM. The whole time distribution/exchange touched upon multiple Areas. There are ramifications pertaining to the interfaces and functionality of other Areas.Slide 13: SANA Steering Group – Discussed issue of using SANA Organization and Contacts registries vs. flat files in use at CCSDS website. To be discussed with CMC Service Site and Aperture registry: concern about lack of entries with actual data and contents .Slide 14: SANA CMC Resolutions 4 and 5 are still outstanding issues to the CMC. These SANA issues are a topic on the CMC agenda, two earlier telecons with the CMC were not sufficient to resolve them. |  |
| **Topics for discussion** Streamlining the CCSDS Plenary presentation: to be addressed at next meeting (or telecom).Open issues raised by various ADs during their CESG presentations were never addressed due to time constraints. |  |
| **IOAG - ICPA and Status of activities.**It has been briefly addressed that the ICPA has been completed with all IOAG projects requited visa (updated) SC#1 and SC#2.All ICPA entries have been linked to (draft or approved) projects, and have been mapped to IOAG services.To be done: * CCSDS comments and prioritization
* Update projects dates.
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| **General:** CESG presentation for CMC: will include the Executive Summary, but for info only. It will be skipped during the oral presentation. |  |
| **Documents with due date for R/U/S** Will be assessed by mid-term Telecon. |  |