**Concept for CCSDS 133.0-B-1 – Revision of Space Packet Protocol and associated Green Book Material**

1. **Purpose**

The proposed work is to update the existing Blue Book, CCSDS 133.0-B-1, Space Packet Protocol (SPP), to clearly state what the SPP protocol, as specified, actually is capable of doing, and do so in a way that does not break any existing, legitimate, uses of SPP to carry application data. The fundamental problem that will be addressed in this revisions project is that SPP is an application layer protocol that defines the Space Packet PDU but it is not a routing protocol.

In addition, these changes to SPP will also result in updates to the supporting green book, with respect to associated diagrams and text in the CCSDS 130.0-G-3 Overview of Space Communications Protocols Green Book. These changes are required for consistency between SPP and this green book.

The work will primarily consist of redefining the concepts such as Logical Data Path and Application Processing ID (APID) Qualifiers to apply specifically to ABA type of configurations and not be used to describe networking.

 **2. Key Technical Features**

We will remove the "routing by management" features documented in the current SPP and those associated green books that could never be used interoperably in any kind of Solar System Internet (SSI) configuration. Furthermore, SPP contains underdeveloped concepts such as Logical Data Path (LDP), Application Processing ID (APID) Qualifiers that are ambiguous and not directly implementable. Note that the LDP concept could work well enough in traditional ABA configurations where there is no question about the packet source or destination. Therefore, the limitation as to where the LDP concepts actually works will be documented. In an SSI deployment, the simple APID structure (which is really the only concrete protocol field that is relevant to LDP) either needs to be "overloaded" or managed in some way to provide APID groups associated with different sources (or spacecraft).  In these deployments some proper network layer service (DTN, or IP where it works) will be recommended.

 **3. Benefits**

Ambiguity and non-implementable concepts will be purged from the SPP and replaced with the limitations on those concepts as well as references to CCSDS protocols e.g., IP over CCSDS or DTN.

 **4. Requirements of prospective missions**

This new project is not driven by new requirements. It is driven by the need to revise concepts introduced during the Yamada restructuring of the SLS documents circa 2000-2003. These concepts do not match current and future networking.

 **ANNEX 1 – Consistency with SLP WG Charter**

The charter goals will be updated to include the following bullet:

* Revise CCSDS 133.0-B-1 to modify and limit the scope of concepts such as Logical Data Path and APID Qualifiers. Redefine them to apply specifically to ABA type of configurations and not use them to describe networking.
* Revise CCSDS 130.0-G-3 Overview of Space Communications Protocols Green Book to be consistent with the revised SPP.

Consistent with this goal, a new CWE Project under SLP WG for CCSDS 133.0-B-1 Revisions is defined in Annex 2. Note that no Prototype is required as only current concepts are to be revised.

**ANNEX 2 – Proposed CWE Project**

**Title:** Revision of Space Packet Protocol and associated Green Book Material

**Document Numbers:** 133.0 Space Packet Protocol, Issue 1 (Blue Book) and 130.0 Overview of Space Communications Protocols, Issue 3 (Green Book)

**Description of Change:** Revise CCSDS 133.0-B-1 to modify and limit the scope of concepts such as Logical Data Path and APID Qualifiers. Redefine them to apply specifically to ABA type of configurations and not use them to describe networking. Concurrently, changes to SPP will also result in updates to the supporting green book, with respect to associated diagrams and text in the CCSDS 130.0-G-3 Overview of Space Communications Protocols Green Book. These changes are required for consistency between SPP and this green book.

**Applicable Patents:** None (TBC)

**Patents Comments:** None (TBC)

**Book Editor (estimated resources + Agency Volunteering):** Total resources: 2 work-months, primarily shared between NASA and UKSA. Nominal time from other Working Group members to review the document. Lead editor: NASA.

**Expected Contributing Agencies:** NASA, UKSA, ESA, CNES, DLR

Expected Monitoring Agencies:ESA, CLTC/BITT

**N.B.:** No Prototype is required as only current concepts e.g., LDP are to be revised.

**Schedule**

**Jan 2018 – May 2019**

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| --- | --- | --- |
| **Total time to complete: 17 months Schedule Milestones** | **Forecast** | **Comments** |
| Project Approved  | 15 Dec 2017  | Before Calendar Year 2018 |
| Internal WG Review  |  |  |
| - First draft circulated to WG  | 12 March 2018  | Prior to Spring 2018 Meeting  |
| - First draft comments due  | 9 April 2018  |  At Spring 2018 Meeting |
| - Second draft circulated to WG  | 17 June 2018  | Before Fall 18 Meeting  |
| - Second draft comments due  | 1 October 2018  | Before Spring 18 Meeting  |
| - Final WB Submitted to AD for further processing  | 1 Nov 2018  | Following Spring 18 Meeting  |
| Secretariat Document Processing  | 15 Dec 2019  |  |
| First Agency Review | 15 Jan 2019  |    |
| RID Resolution 1 | 1 Feb 2019  |    |
| Secretariat Document Processing 2 | 1 March 2019  |    |
| Final Agency Review | 15 April 2019  |    |
| RID Resolution 2 | 1 May 2019  |    |
| CMC Resolution | 30 May 2019  | Includes CESG Poll + CMC Pol  |