Response from Takahiro Yamada on 12/18/17 regarding my suggested update to SPP Blue Book

1. Remove Logical Data Path (LDP), Path ID, APID Qualifiers from the document

Takahiro’s response: I agree with this. I kept these concepts only to maintain backward compatibility with the old AOS srtandard, which was in wide use at that time.

2) SLP WG needs to make explicit within SPP, that the SPP Secondary Header is an extension mechanism that can be used to manage data forwarding. Where data forwardingis defined in CCSDS 901.1-M-1 as “the act of transferring data from its source towards its destination, which may be in space or on the ground.”

Takahiro’s response: I don't object to this. However, there are other ways for performing data forwarding. One of them is to use multiple headers, which is described in the paper attached to this message. I originally developed this idea for a small lunar network of JAXA that was already cancelled, but a group of Japanese universities are considering deploying a small Mars network consisting of small satellites and cube sats, and they are considering using this idea for packet forwarding. CCSDS Space Packet is already used on a Japanese deep space cube sat (Procion, launched in 2014) and two lunar cube sats to be launched with SLS (Omotenashi and Equuleus), and they want to reuse as much as possible the exsiting data systems of these cube sats.

3) SPP also has a dual functionality which is not clearly defined. It’s first role is that of an application layer data structure using the APID as the (source or destination) data identifier, depending on directionof flow. It’s second role is that of a shim protocol that encapsulates application layer PDUs into frames for

transfer across the CCSDS data link layer. The shim function is defined in the CCSDS Encapsulation Service. Note that both roles can occur in any given system design and that these different roles of application data structures and protocols shims must be managed in APID space. The dual functionality of SPP will be documented in the revised SPP.

After we have done this SPP clean-up, to remove ambiguities and functional protocols, and based on discussions with you and Jonathan Wilmot (and others) we are considering development of a separate extensionto the SPP.  We have in mind defining a formal, but optional, extension to SPP that defines an SPP secondary header extension to provide a general mechanism for Logical Data Path endpoint identifiers.  We need to approach this

carefully in order to develop something that can support packet forwarding in a closed subnetwork and that does not collide with any use of SPP, with this extension, in a DTN or IP open network environment.  We would like to solicit your interest in this.

Takahiro’s response: That's interesting. My preference right now is the technique of using multiple headers described in the attached paper (because the impact to the existing infrastrure is minimal), but I'm also interested in discussing other options with your group.

4) We need to expunge any mention of the term “routing” in SPP since this function is really carried out by true network protocols e.g., IP or DTN. At most, we believe that SPP could facilitate data forwarding within a single closed subnetwork. But even that function would have to be designed e.g., by allowing further specification within the packet secondary header. That portion of the SPP revision is not yet approved but will be further discussed once this first round of changes is understood.

Takahiro’s response: OK.

5) Section 2.1.3 Addressing -> Remove this section

Takahiro’s response: OK.

6) Remove the Packet Service –> Packet Service is already defined in the Space Link Protocols

Takahiro’s response: OK.

7) Remove the Octet String Service

Takahiro’s response: This is another leftover from the old AOS book, and I agree with you.

8) SPP Procedures at Sending and Receiving Ends

a) Remove Packet Assembly function and Packet Extraction Function since they are Octet String Functions; They do not

seem to be used by any space agency; there is no delimiter defined for interoperability.

b) Convert the Packet Transfer Function into a Packet Data Forwarding Function and limit its scope to data transfer

within a single closed subnetwork in an A-B-A configuration.

c) Remove Packet relay function on the sending side (which is really a routing function, outside the scope of SPP) and

remove the Packet Recovery Function on the receive side.

Takahiro’s response: OK.

End of Message