



Fw: CCSDS 401 structure naming convention - proposed changes - list of received feedback - proposed text for option 3b

Enrico Vassallo to: Kenneth S (JPL-332B)[Jet Propulsion Laboratory]

30/04/21 11:32

Dear All,

find below a proposal for the text under option 3b for consideration at the joint RFM/C&S WG meeting. Should the groups decide to go for this option, the text will be up for improvements and should not be considered final at this stage.

Please do not start discussing the text now (if not internally to your organization). I am busy with European frequency management meetings and will have no time to reply (this is one of the reasons for shifting the remote meetings of RFM).

Regards, Enrico

For historical reasons, the Telecommand name is kept but used in this book as a generic name encompassing spacecraft commands as well as any other data transmitted to the spacecraft directly from an Earth station or via another spacecraft

For historical reasons, the Telemetry name is kept but used in this book as a generic name encompassing spacecraft housekeeping data as well as any other data (science, video, etc.) transmitted from the spacecraft directly to an Earth station or via another spacecraft

Note that differently from what said before, these notes are required also in section 1.4 which contains some text of section 2.0. There is a need to discuss if they should also be on page 2.0-3 and 2.0-5, just below the section recap tables.

----- Forwarded by Enrico Vassallo/esoc/ESA on 30/04/21 08:57 -----

From: Enrico Vassallo/esoc/ESA
To: sls-rfm@mailman.ccsds.org
Cc: Andrea Modenini/estec/ESA@ESA, "Andrews, Kenneth S (JPL-332B)[Jet Propulsion Laboratory]" <kenneth.s.andrews@jpl.nasa.gov>
Date: 16/04/21 09:03
Subject: CCSDS 401 structure naming convention - proposed changes - list of received feedback

Dear All,

I have received a number of proposals, not all aligned Basically, we now have many more possibilities than I had thought of:

1. Change the title of section 2.2 to something like "Telecommand and forward data" and that of section 2.4 to something like "Telemetry and return data"

Pro: Easy title

Con: Would need to check in detail all recommendations in 2.2 and 2.4, which may require a considerable effort

2a Change the section titles to "Telecommand (including data transfer)" and "Telemetry (including data transfer)"

Pro: Avoid checking current recommendations for consistency

Con: Meaning/interpretation may not be understood/clear

- 2b As 2a but using as alternative to "data transfer" the "payload" word
Pro: Avoid checking current recommendations for consistency
Con: Payload is not generally utilized to indicate the same thing in different fora
- 3a Ignore this semantic problem and leave everything unchanged
Pro: no effort
Con: May cause confusion/does not address the concern
- 3b Address semantic problems with dedicated notes in section 2.0 concerning sections 2.2 and 2.4, and leave everything else unchanged
Pro: minimal effort
Con: none identified
- 4. Change the title of Section 2.2 to "Forward" and that of 2.4 to "Return" by itself or whatever other word is needed such as "data, link, etc."
Pro: as option 1
Con: as option 1 and depending on exact text also as option 2a/2b

Given that this terminology is also used in C&S WG books, it is proposed that discussion be continued at the upcoming joint RFM/C&S WG meeting.

Thanks to all respondents and to Shannon for providing most pros and cons.

Regards, Enrico

----- Forwarded by Enrico Vassallo/esoc/ESA on 15/04/21 14:32 -----

From: Gian Paolo Calzolari/esoc/ESA
To: Enrico Vassallo/esoc/ESA@ESA
Cc: "Jon Hamkins" <Jon.Hamkins@jpl.caltech.edu>, "Rodriguez, Shannon (GSFC-5670)" <shannon.rodriguez-1@nasa.gov>, "Sank, Victor J. (GSFC-567.0)[SCIENCE SYSTEMS AND APPLICATIONS INC]" <victor.j.sank@nasa.gov>, "Fong, Wai H. (GSFC-5670)" <wai.h.fong@nasa.gov>, "Lee, Wing-tsz (GSFC-5670)" <wing-tsz.lee-1@nasa.gov>
Date: 10/04/21 11:50
Subject: Re: [SIs-rfm] [EXTERNAL] Re: CCSDS 401 structure naming convention - proposed changes

Enrico,
Shannon,

it looks as Option 3 by Shannon could be reworded as follows showing then a couple of sub options

- 3. Leave **titles** unchanged and
- 3. Leave **titles** unchanged, and
 - 3a Ignore semantic problem and leave everything unchanged
 - 3b Address semantic problems with dedicated notes.

consider also that - in my quality of Area Director - I comment on this issues with a critical spirit trying to highlight points to be considered (as e.g. side effects) to take the best decision but, as usual, I will stay and support the WG choice.

Regards

Gian Paolo

Enrico Vassallo

From: Enrico Vassallo/esoc/ESA To: "Rodriguez,..."

10-04-2021 11:37:35

From: Enrico Vassallo/esoc/ESA
To: "Rodriguez, Shannon (GSFC-5670)" <shannon.rodriguez-1@nasa.gov>
Cc: Gian Paolo Calzolari/esoc/ESA@ESA, "Jon Hamkins" <Jon.Hamkins@jpl.caltech.edu>, "Sank, Victor J. (GSFC-567.0)[SCIENCE SYSTEMS AND APPLICATIONS INC]" <victor.j.sank@nasa.gov>, "Fong, Wai H. (GSFC-5670)" <wai.h.fong@nasa.gov>, "Lee, Wing-tsz (GSFC-5670)" <wing-tsz.lee-1@nasa.gov>
Date: 10-04-21 11:37
Subject: Re: [SIs-rfm] [EXTERNAL] Re: CCSDS 401 structure naming convention - proposed changes

Hi Shannon.

Feel free to copy the whole WG for transparency.

I think that Jon and Gian Paolo proposed another option or a subset of 3 with the addition of explanatory notes.

Given the recommendation by Jon to involve C&S, I think we will have to discuss it at the next videoconf.

I will wait until the deadline to finalize the list of proposals.

Nice week-end,

Enrico

On Apr 9, 2021, at 20:59, Rodriguez, Shannon (GSFC-5670) <shannon.rodriguez-1@nasa.gov> wrote:

Hello Enrico,

(Note that I removed the listserv and only cc'd the ones that had replied and GSFC people)

I see 4 options (1 added per email trail) summarized again below. From these, if we are voting online, I would go with the ones with the word Forward/return in it (options 1 or 4)

1. Change the title of section 2.2 to something like "Telecommand and forward data" and that of section 2.4 to something like "Telemetry and return data".
 - Pro: Easy title
 - Con: Would need to check in detail all recommendations in 2.2 and 2.4, which is a lot of work I think.
2. Change the section titles to "Telecommand (including data transfer)" and "Telemetry (including data transfer)"

- Pro: avoid checking current recommendations for consistency.
 - Con: Meaning/interpretation
- 2a) Or, could use as alternative to "data transfer" the "payload" word although this is not generally utilized to indicate the same thing in different fora.
3. Ignore this semantic problem and leave everything unchanged.
 4. Change the title of Section 2.2 to "Forward, and 2.4 to "Return" by itself or whatever other word is needed such as "data, link, etc."

Thanks,
Shannon

From: SLS-RFM <sls-rfm-bounces@mailman.ccsds.org> on behalf of Jon Hamkins via SLS-RFM <sls-rfm@mailman.ccsds.org>
Reply-To: Jon Hamkins <Jon.Hamkins@jpl.caltech.edu>
Date: Thursday, April 8, 2021 at 4:59 PM
To: "Gian.Paolo.Calzolari@esa.int" <Gian.Paolo.Calzolari@esa.int>, Victor Sank <victor.j.sank@nasa.gov>
Cc: "sls-rfm@mailman.ccsds.org" <sls-rfm@mailman.ccsds.org>
Subject: Re: [Sls-rfm] [EXTERNAL] Re: CCSDS 401 structure naming convention - proposed changes

I think of "telemetry" as a generic term which does not necessarily imply the type of data or its direction (but it could, based on context or historical convention). For example, in the optical coding standard the title "HPE telemetry signaling" is used for a section describing one type of optical code+modulation. The data can be anything as long as it is put in Transfer Frames, and the direction can be forward or return.

----Jon

Jon Hamkins

Chief Technologist, Communications, Tracking, and Radar Division

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On 4/8/2021 1:15 PM, Gian.Paolo.Calzolari@esa.int wrote:

Again,

why should a modulation care whether the bits are from a USLP Frame or

something else?

I find true the reverse, who is deciding between TM/AOS/USLP Frames may do a choice or another depending on the technology available.

As well, considering your correct statement "An Earth based receiver can be much more complicated than a space based receiver." it is also true that if you simply call that link a return link the receiver could also be in space. Then are you really simplifying the matter?

About name changes, I keep my preference for NOTES inserted where needed with more efficiency and less effort with respect to the side effect to checked within the document and outside the document (e.g people used to some terminology getting confused, references screwed up etc etc)

My cent

Gian Paolo

From: "Sank, Victor J. (GSFC-567.0)[SCIENCE SYSTEMS AND APPLICATIONS INC]" <victor.j.sank@nasa.gov>
To: "Gian.Paolo.Calzolari@esa.int" <Gian.Paolo.Calzolari@esa.int>
Cc: "sls-rfm@mailman.ccsds.org" <sls-rfm@mailman.ccsds.org>
Date: 08-04-21 20:45
Subject: RE: [Sls-rfm] [EXTERNAL] Re: CCSDS 401 structure naming convention - proposed changes

Gian Paolo,

As much as I like details, I agree that the title need not say what the data is. But it would be good to change the term "Command" and "Telemetry".

A big part of the intent of USLP is to make the "forward" link and "return" link as similar as possible. But we may still want to treat them with some differentiation. An Earth based receiver can be much more complicated than a space based receiver. An Earth based transmitter can have much more EIRP than a space based one. The section titles can be simple but if possible, it would be nice if they informed the reader of the differences. It may be as simple as words like "forward" and "return" to indicate the initiator and the respondent, and let the section contents cover the details.

Thanks,
Victor

From: Gian.Paolo.Calzolari@esa.int <Gian.Paolo.Calzolari@esa.int>
Sent: Thursday, April 8, 2021 2:14 PM
To: Sank, Victor J. (GSFC-567.0)[SCIENCE SYSTEMS AND APPLICATIONS INC] <victor.j.sank@nasa.gov>
Cc: Enrico.Vassallo@esa.int; Jon Hamkins <Jon.Hamkins@jpl.caltech.edu>; sls-rfm@mailman.ccsds.org
Subject: RE: [Sls-rfm] [EXTERNAL] Re: CCSDS 401 structure naming

convention - proposed changes

Victor,

my basic question with respect to a specific aspect of this discussion is the following: does RFM WG really need to enter into the detail of the type of carried data?

I mean, the input to a modulator is normally a stream of encoded bits. Why would RFM need to know if those bits are from Housekeeping Telemetry or from a scientific payload or from both?

The same for telecommand: does the modulator care about knowing the data contain a command or a memory upload?

All this acknowledging that other points of the discussion may require further discussion by the WG.

Ciao

Gian Paolo

From: "Sank, Victor J. (GSFC-567.0)[SCIENCE SYSTEMS AND APPLICATIONS INC]" <victor.j.sank@nasa.gov>
To: "Jon Hamkins" <Jon.Hamkins@jpl.caltech.edu>, "Gian.Paolo.Calzolari@esa.int" <Gian.Paolo.Calzolari@esa.int>, "Enrico.Vassallo@esa.int" <Enrico.Vassallo@esa.int>
Cc: "sls-rfm@mailman.ccsds.org" <sls-rfm@mailman.ccsds.org>
Date: 08-04-21 20:04
Subject: RE: [Sls-rfm] [EXTERNAL] Re: CCSDS 401 structure naming convention - proposed changes

Dear Enrico,

Before jumping into the section titles, I think we need to agree on the meaning of the basic terms.

It seems to me that the term "command" is a limited term and should be improved. Saying "uplink" is no longer good enough since we must cover cross links. The term "Forward Link" has value because it can cover many cases and to me implies the sender, no matter if it is an "up" or "down" link. It does not cover what kind of data is being sent.

A remaining part of the terminology question is whether we want to term to cover the type of data or information that is being conveyed. The term "command" is very specific, it is a command and not science data or a software load. But the term "telemetry" seems to be less specific. I generally think of it as the return of housekeeping and engineering information but I believe the term is used very general to also include the returned (down linked) science or operational data. We need to define what we mean by "telemetry". My vote would be to use that term "telemetry" for the housekeeping and engineering data on the return link. On some projects we refer to the other returned data as the "operational" data for a space weather satellite and "science" data for a purely science satellite. I do not have a strong opinion, just stating terms I have seen in use.

The section titles

Seems to me that section 2.2 Command and 2.4 Telemetry, titles need to be improved.

I hesitate to propose the possible rewording until we decide on the definition of the terms and if we what the title to convey of the kind of data transferred. I think the title should contain some detail but at the same time be general enough to allow for things we have not thought of, if such thing is possible.

Regards,
Victor

From: SLS-RFM <sls-rfm-bounces@mailman.ccsds.org> **On Behalf Of** Jon Hamkins via SLS-RFM

Sent: Thursday, April 8, 2021 11:20 AM

To: Gian.Paolo.Calzolari@esa.int; Enrico.Vassallo@esa.int

Cc: sls-rfm@mailman.ccsds.org

Subject: Re: [Sls-rfm] [EXTERNAL] Re: CCSDS 401 structure naming convention - proposed changes

I think the note is a good idea to explain the more general nature of these transmissions. If a change in terminology is made, I suggest coordination with C&S and OPT Working Groups, because their blue books are also using the terms telemetry and/or telecommand.

----Jon

Jon Hamkins

Chief Technologist, Communications, Tracking, and Radar Division

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On 4/8/2021 3:21 AM, Gian.Paolo.Calzolari@esa.int wrote:

Dear Enrico,

frankly speaking, the third possibility look to me the best one.

If strongly needed, a note could be added about using historical titles.

The general problem is that using new/different terms - as you correctly remarks - 401.0-B may enter in conflict with different fora including usage within CCSDS.

As an example, the notation forward/return (link) is mainly used to generalise the diction specially when one side is not on Earth as done in Proximity-1 Physical Layer book (see <https://public.ccsds.org/Pubs/211x1b4e1.pdf>)

Ciao

Gian Paolo

From: Enrico.Vassallo@esa.int
To: sls-rfm@mailman.ccsds.org
Date: 08-04-21 10:05
Subject: [Sls-rfm] CCSDS 401 structure naming convention - proposed changes
Sent by: "SLS-RFM" [<sls-rfm-bounces@mailman.ccsds.org>](mailto:sls-rfm-bounces@mailman.ccsds.org)

Dear RFM WG colleagues,

discussing high rate 22 GHz uplink recommendations, we noted that the current structure naming convention may not be appropriate to cover "generic" data transfer applications:

| | | | |
|-----|---------------------------------------|-----|---------------------|
| 2.1 | <i>Earth-to-Space Radio Frequency</i> | 2.4 | <i>Telemetry</i> |
| 2.2 | <i>Telecommand</i> | 2.5 | <i>Radio Metric</i> |
| 2.3 | <i>Space-to-Earth Radio Frequency</i> | 2.6 | <i>Spacecraft</i> |

One possible solution would be to change the title of section 2.2 to something like "Telecommand and forward data" and that of section 2.4 to something like "Telemetry and return data".

This is to distinguish between telecommand and uplink data transfers (like on-board software patch uploading, etc.) and between (HK) telemetry and payload transmissions.

Note that already now recs 2.4.8 and 2.4.23 do not mention telemetry in the title and deal with payload data. However, both recommendations have pictures for symbol rate definition with captions indicating telemetry symbol rate. I assume we will have the same in section 2.2.

One would need to check in detail all recommendations in 2.2 and 2.4, which is a lot of work I think.

Another possibility is to change the section titles to "Telecommand (including data transfer)" and "Telemetry (including data transfer)" so that we can avoid checking current recommendations for consistency.

In addition, one could use as alternative to "data transfer" the "payload" word although this is not generally utilized to indicate the same thing in different fora.

The third possibility is to ignore this semantic problem and leave everything unchanged.

Could I have your view by April 15 COB?

Regards, Enrico