**Inputs to CCSDS Future Strategy (AI CMC-A-2014-04-05)**

1. **Introduction**

This is a summary of the comments received from CMC members on the CCSDS Strategic Plan, as depicted in the CCSDS Strategic Roadmap presentation. The summary has been compiled by CNES, Jean-Marc Soula, NASA, James Afarin ad ESA, Juan Miró and should serve as a basis for the discussion on CCSDS Future Strategy planned for the CMC meeting on 18th Nov 2014 in London

1. **Content of the Strategic Plan**
2. GENERAL
   1. Layering of Plans

The extended version of the Strategic Plan is based on the current planning of the activities in the CCSDS areas (the Operating Plan = OP) and the Future Plans (FP). OP and FP form the CCSDS Work Plan. Of course, FP’s in each area are not always identified with the same advance notice: however, to manage the CCSDS activities the CMC needs to rely on a uniform level of the FP, in order to anticipate future changes and to prepare for organization adaptations.

While the OP will be kept alive as the projects in the FP get approved and actually started, the FP itself is not fed by any existing process, which after some time may result in a lack of visibility of what CCSDS will do in the short / medium term.

**SUGGESTION 1: the CSEG should be tasked to periodically revisit the FP items identified in the extended SP as “Future Work”, so making the FP a live management tool.**

* 1. Future plans

It is not 100% clear how the Areas collected the requirements identified to propose the “Future Work” items this time. However, as most of the new requirements are driven by the evolution of the technology, it may be expected that the proposed “Future Work” items are coming from the Working Groups (WG) in a bottom up approach.

In the relationship of CCSDS with other international organizations, the requirements from other organizations have always been difficult to accommodate in the CCSDS WP. However, CCSDS cannot pretend to serve the interests of such organizations if there is no process to integrate their requirements in the global picture.

In this context, the “Roadmap” could help verify if the new requirements fit within the list of the CCSDS high level objectives, which area(s) is (are) concerned and which reasonable time frame should be considered to develop the required standards.

Today, there is an interface and a procedure to process requirements coming from the IOAG but it could also be necessary in future to process requirements that come from the ISECG or similar organizations at a later stage. CNES supports the idea that CCSDS will be more credible if it integrates the external requirements in its WP.

**SUGGESTION 2: the process to integrate the external requirements in the CCSDS WP, as part of the FP, should be developed, so that schedules, priorities and resources for the added work may be discussed and arbitrations be made, in view of the other on-going or planned activities.**

* 1. CCSDS Area structure

**SUGGESTION 3: The structure of the CCSDS may be revisited taking into account the following:**

* The work programme envisaged in each area in the mid to long terms (2020)
* Overlap should be minimised, by fostering reuse across WGs and Areas and by better understanding the CCSDS work assignments and the organization’s future objectives
* A reference architecture for the CCSDS standards should be developed and used as an overall blueprint for the organization to prevent future overlap.

1. COMMENTS BY CCSDS AREA

The following questions also need to be discussed between CESG and CMC, in order to come to a common understanding and an agreement on needs, schedule and resources:

SEA

1. The standards on security architecture and D-DOR will be completed by 2016. **No other standards are currently approved beyond 2016. Goals achieved?**
2. SEA plan of work does contain approved documents for XML schemas although this is needed in all areas, in particular CS, MOIS and SOIS. **Is this an issue?**
3. SEA midterm focus (2017) is on timeline exchange (overlap with MO M&C / MAL**). Issue to be resolved**
4. SEA long term plan is to standardise time services; this was discussed a long time ago in CMC but no decision yet. **A decision is needed in order to ensure resource availability**
5. Goal #7 CCSDS Standards Reference Architecture is a project not approved. **This project is considered as high priority and should be started asap. This decision should be taken by the CMC in the very near future.**
6. Security: key management BB is behind schedule and should terminate 2017. **Is this an issue for other WGs (e.g.: interdependency with SLS / SDLS)?**
7. XML SIG is still a SIG while standards should be produced within 2 years: **is there an issue as the WG(s) is (are) still to be created?**
8. Only Security and DDOR are approved WGs/Projects; Timelines and XML SIG could / should start soon, while not yet present in the FW.   
   In this context, **is it wise to authorize the new Architecture activities** (goals 3 and 7) which, in the past have always suffered a lack of resources, **in the proposed schedule?**   
   **Where are the priorities?** **Is there a risk to delay or interfere with one or the other of the approved / engaged activities?**
9. Security and DDOR WGs have no activities identified as part of FP beyond 2016. **Is it anticipated that all goals will then be achieved and the group has no further activity ?**

MOIMS

1. Goal 5 “Digital Repository Criteria” completed (no current/future work)
2. Data and Metadata External Framework standards and Data Archival and Retrieval work is ending in 2016. Goals achieved?
3. **Mid-term objectives (2017-2018) only for MO services; they are linked to the standards on technology mapping and binding. The resources needed for this work should be assessed.**
4. No long terms objectives (2019-2020) defined, although MO services are likely to take longer
5. Most of the MO services BB’s in the CWE are not started and/or are behind schedule. **What is the strategy proposed to progress these projects?** **Will the IOAG / MOSSG inputs on service priorities be considered to reschedule the parallel tasks?**
6. **Workplan for Tele-robotics defined?**NAV and DAI WGs have no activities identified as part of FP beyond 2016. **Is it anticipated that all goals will then be achieved and the group has no further activity ?**

CSS

1. All activities in the FW are behind schedule for the CSTS WG. Nevertheless, this group still shows a long list of parallel activities to be conducted. **What is the strategy proposed to progress these projects or, preferably, to prioritize a few of them so that at least some CSTS standards may be proposed to users?**
2. Extensible Terrestrial data Transfer services : approved activities are almost completed (in 2015). With the exception of Tracking Data CSTS BB no projects are approved. **When and what should be considered in 2015 onwards related to this goal?**
3. Generic File Transfer to be moved to CSS Goal #4. **Will this goal have been achieved on completion of this standard by 2015?**
4. Service Management goals defined in the long term, but only 2 documents approved. **Decision required for the approval of these projects on the basis of a resource assessment.**
5. CSS CS-SM projects have target dates in the SP, as part of the FP. Nothing similar exists in the FW where status and target dates are blank. **When will a tentative schedule be confirmed?**

SOIS

1. Appl. Support WGs has no activities identified as part of FP beyond 2015. **Is it anticipated that all goals will then be achieved and the group has no further activity ?**
2. The SOIS Area has only one WG (Wireless) and no activities identified as part of FP beyond 2017. **Is it anticipated that all goals will then be achieved and the group has no further activity ?**
3. Should the group be disbanded earlier and the WG activities be **re-allocated to another area (Wireless ⬄ SLS?)**?
4. More globally, only short term (2014-2015) workplan defined. **Is this area required beyond 2015? Should CCSDS maintain a role in onboard interface standards?**
5. Future developments for onboard “Standard Avionics Architectures” were mentioned in the 2014 CMC spring meeting (SUMO). **Is this a viable direction; should CCSDS get involved in standardising onboard architectures?**

SLS

1. All WGs have a schedule which minimize the parallel activities. Prioritization seems to be made upfront.
2. Data compression and SDLS WGs have no activities identified in the RMP as part of FP beyond 2015 / 2016. However, the FW shows target dates beyond those (2017 / 2016). **Is it anticipated that all goals will then be achieved and the group has no further activity ?**
3. Mid-long term is the Next generation Space Data Link protocol. **What are the resources required for this development by 2018. Are they confirmed?**
4. Optical Communications seems to be the main/only longer term activity**. Is this endorsed by the CMC?**

SIS

1. SIS Goal 1 “Use of Internet standards” has no associated workplan. **Has the goal been achieved?**
2. Application Layer protocols: no work is planed beyond 2015. Has the goal been achieved?
3. Goal #2 solar system Internet: No approved project beyond 2017. What should be approved to achieve this goal. What are the resources needed?
4. The FW reflects projects behind schedule and target dates quite earlier than those in the RMP/SP. An alignment is required.
5. Contact graph and Bundle security projects have target dates in the RMP/SP, as part of the FP. Nothing similar exists in the FW where status and target dates are blank. **When will a tentative schedule be confirmed?**
6. **Comments on format and scope of CCSDS Strategic Plan** 
   1. RMP generation

It is a good idea that the RMP is developed to serve for presentation within the member agencies or in international fora, as this gives a clear vision of what CCSDS is doing and why, w.r.t. the CCSDS Strategic Goals.

At the CMC level, it will also be a useful tool to manage the CCSDS.

To be efficient, the RMP should be kept up to date, for projects and schedules, and the effort to produce it should be kept to the minimum. The main issue today, to generate the RMP from the CWE is that, while the FW may be used to supply the latest status on the OP, the items belonging to the FP are not (all) available in the CCSDS IT system. Today, only the extended SP contains the items for the FP…

**SUGGESTION 4: a solution must be found to generate the RMP automatically after the revisions of the FW or SP are made.**

* 1. Mapping of technical goals per area

Initially, the six Technical Goals in the SP were supposed to primarily correspond to objectives per each of the six Areas:

Technical Goal#1 = SLS

Technical Goal#2 = CSS

Technical Goal#3 = MOIMS

Technical Goal#4 = SIS

Technical Goal#5 = SOIS

Technical Goal#6 = SEA

While reading the “Technical Goals - Mapping per Area” section of the RMP, it becomes clear that some of the objectives are shared and several goals from different Areas may contribute to the overall goal. In addition, this highlights some degree of interdependency between activities in different Areas: the overall goal will be met only when all Area goals are completed ; when delaying one item in one Area, other items contributing to the same goal run the risk to become stand-alone standards not integrated in the global solution proposed by CCSDS to its users. Therefore, it is desirable that this mapping is accurate and agreed by all.

**SUGGESTION 5: it would be helpful if the mapping presented in the RMP is double checked by the AD’s and validated at CESG level, when instrumented as per suggestion 3.**

Comments from Nasa

1. The strategic plan is more an implementation plan.
2. Almost all areas have nothing to work on after 2018, some even 2016
3. **Comments on format and consistency of Strategic Roadmap presentation**

General

The representation of the strategic plan in a roadmap format is useful to understand how far reaching the plans from the WGS are in the coming years.

Comments from NASA:

1. Each recommended standard (bars in slides) should be associated with a specific diamond (scheduled time of completion)
2. Slide 12: MOIMS mappings.  MOIMS goals 6 and 7 (at least) should also map to higher goals 4 and 5 since 4 refers to LEO operations and 5 mentions on-board autonomy.
3. Slide 13: CSS Goal #4 Generic File Transfer is not mapped to any of the Technical Goals.  Recommend mapping this to at least Technical Goal #2.
4. Slide 16: The Delta-DOR Operations MB due 2015 is missing from the SEA Goals #2.
5. Slide 20: In the MOIMS Goal #2 there is an additional product (Attitude Data Message BB) that is not in the strategic plan.
6. Slide 20: In the MOIMS Goal #3 there are additional products (Control Authority DATA Structure XML Format BB and Information Curation Process BB) that are not in the strategic plan.
7. Slide 26:  The Generic File Transfer is a project of CSSM with a completion date of January 2017.
8. Slide 30: The Common Dictionary of Terms for Onboard Devices is missing from SOIS Goal #3.
9. Slide 39: The CFDP over the CCSDS Encapsulation Service MB is missing from SIS Goal #3.
10. Slide 40: The SIS Architecture Document is completed.
11. Slide 40: The Contact Graph Routing BB will be completed in 2017.

Comments by CNES

Whether we call it roadmap (RMP), strategic, tactical or implementation plan is not critical, as long as it is agreed that this should be used to guide the activities and resources in the CCSDS, in addition to the CWE FrameWork (FW).

The presentation per Area is very useful but it could be improved by:

* Making clear which Area Goals are already approved and which ones are just future plans (non-approved WG’s or projects) ; a color code could be used ;
* Adapting the length of the future project boxes to the expected duration of development: as all aligned to 3 years, it could give some bad impressions that new projects should have already started or that some complex standards may be produced in a short timeframe.

The following sections provide first level comments on the situation per Area, as could be derived from the analysis of the RMP as is.

Comments by DLR

1. According to the additional request during the last telecom DLR went through the Strategic Roadmap and checked first for consistency with the strategic plan and the current version of the CWE. Beside that some general remarks, which came up during the checking are also included.
2. The Remarks are following the CNES (Jean-Marc) approach as requested in the telecom..
3. First: our set of comments delivered end of June are still valid.
4. Second: we agree with CNES comments. Especially with the general remarks to the presentation per Area. The current version of the RMP already uses a color coding to distinguish the state of a project. But it would be fine, if the length of a project could be added to the publishing date. This can indicate, if someone is already working on the standard. If we can add the according CCSDS number to the describing text the correlation to the project might be easier.
5. Another issue might be dependencies. For example today SEA-SEC is waiting on developments of the Space data link Sec WG. Might be the indication is given in the text, because it is a special case.
6. Relations are given on the page “Relations between Areas”. But this page needs some explanations on how to read the figure.
7. If we don’t have standards already produced, in production or planned for one of our goals, we should delete the goal.
8. For DLR the item 5 of technical goal 6 is not clear: What do we understand on “CCSDS support services and capabilities”? This leads to the question on do we need management goals as well? Where do we define the need to interact with IOAG or to pick up technical developments for our standardization work.
9. SEA-Goal 3 defines reference information architecture. This is indicated as not yet in the CWE. Currently there is no WG for this item. How showed we tread it? Should it be an action to the CESG to create a future project to handle this item?
10. SEA-Goal 5/6 indicates in the CWE to produce blue and magenta books in the future. The magenta has to be added.
11. Times have to be adjusted according current project definitions. A summary is give in the attached exel sheet.
12. On MOIMS Gola #3 an XFDU Schema Registry Repository Information Model and Service Interface should be mentioned. From the CWE it is not clear, if that standard is canceled, pending or already done.
13. The Specification Framework Concept mentioned in CSS Goal #2 is a green book.
14. In SOIS Goal #1 “XML Specification for Electronic Data Sheets for Onboard Devices and Software Components” is missing, In SOIS Goal#2 there is already the indication that a mentioned project is not in the CWE any longer, but a different one. This has to be adjusted.
15. The development in SOIS Gola#3 the “Electronical Data Sheets for On-Board Devices are currently layouted as a green book.
16. In SLS Goal#4 the item “Spectral Pre-Processing Transform for Multispectral & Hyperspectral Image Compression” is missing.
17. We had already a lengthy discussion on is something missing in our collection. At least from a DLR view there are requirements for robotic missions, which are currently not covered by the approach of the robotic WG. In London there should be some discussion on this issue.
18. **Overlaps**

The existing overlaps have been documented by CESG Chairs on the basis of the current status.

In particular the following overlaps are seen as critical

* MOC v TTC Network Planning v SSI Planning
* Monitor and Control Recommendations: Spacecraft vs TTC Network
* TLM, CMD, RNG services

All three involve MOIMS and CSS

These overlap shall be discussed at the workshop in London and a way forward agreed and reported to CMC in London for endorsement