**CCSDS Spacecraft Monitor and Control (SM&C) Working Group**

**Fall 2018 Workshop - October 15-19, 2018**

**Berlin, Germany at DIN Deutsches Institut für Normung e.V.**

# Summary (from the final plenary presentation to the MOIMS Area Director):

* Presented the status of the LOP-G, OMG, and IOAG
  + Noted IOAG push towards development of an interface gateway between Agencies
  + Drafted set of technical points for consideration for an international interface gateway based on MO
* Reviewed all 5 year review documents
* Presentations were given on CNES’ ISIS control system and the ESA/JPL “Shadow” project
* Significant amount of time devoted on Concept Green Book update
  + Initial draft significant improvement on current published version
  + Excellent work by the WG guiding the update on interoperability and usage communities
* Held joint meetings with Sec and DTN WG
  + WG considering a new MAL binding blue book to DTN
* Worked to move File Management services from draft to active project
  + First draft of service white book was presented and discussed
* Held both an open and WG discussion on the OMG C2MS/MO overlap
* MPS WG appreciated the support and assistance of the SM&C WG on Thursday
* Joint meeting with SAWG and SOIS was very constructive
  + We believe there is emerging clarity in the relationship between MO and SOIS/EDS

# Agenda (revised throughout the meeting)



# Attendance

Twenty-one people attended all or portions of the SM&C meetings, with the group growing even larger during joint meetings. Attendance at any single session varied from 8 people to about 20.

[see attendee list on next page]



# Files posted to CWE

Files from the meeting have been posted to the CWE under the MOIMS Area / SM&C / Meeting Materials / 2018 / Fall directory:

1. These minutes
2. SMandC Doc Status – Documentation status report
3. MOIMS-SC-Agenda
4. LOP-G / IOAG / OMG Quick Update
5. CNES – ISIS Use Cases
6. Security presentation (from joint meeting)
7. Mario Merri paper on LOP-G
8. Mario Merri presentation on LOP-G
9. Interface Gateway Drivers
10. Overlap Position Paper

Also, the presentation given at the main Plenary Meeting can be found on CWE at:

<https://cwe.ccsds.org/cesg/docs/CWE%20Private/Meetings/2018%20Fall%20Meeting%20Berlin/d2-F18-Opening-Plenary20181014.pptx>

# Day 1. Monday October 15, 2018

* Full CCSDS and MOIMS Plenary meetings were held in the morning.
* SM&C WG began at 11:00 am with general discussion of the week’s plans.

* Dan Smith gave a brief overview on the status of LOP-G (very little news to report), IOAG and the OMG.
  + We need to find ways to interact with the LOP-G people. **ACTION: Contact Jonathan Wilmot for LOP-G access ideas, since SOIS has been very successful.** The IOAG Mission Operations Systems Strategy Group (MOSSG) is addressing comments in their final report and catalog and hope to be done in December. MOSSG looks at needs for ground-ground interoperability and are not tasked with assessing CCSDS or MO, although the catalog will point to possible MO solutions for certain needs.
  + The OMG has voted to approve C2MS and comments are being addressed prior to publication in early 2019. OMG has issued an RFI for ideas on a common display exchange format.
* Reviewed MAL BB and Java API MB
  + Current list of changes are felt to only be editorial for the Blue Book, therefore reconfirmation shall be requested. **Action: Request AD to start poll for MAL BB reconfirmation.**
  + Java API Magenta Book list of possible changes is more extensive, the estimation in terms of effort was approximately 3 weeks to address the 33 RIDs, and members of the WG have been asked to see if they have the resource available to make the update. It should be noted that none of the listed changes imply the current specification is broken, they are only enhancing it. **Action: WG to find single agency to do the work.** CNES did the original, JPL may be able to work the current RIDs.
* Small discussion on SM&C Glossary of Terms
  + It was noted that Brigitte Behal had produced these around the Spring 2018 meeting
  + Sam Cooper had reviewed them against the current set of published and in development books
  + A number of minor discrepancies had been found but nothing fundamental
  + The WG should attempt to build the agreed list of SM&C Terms and ensure that all future publications use these consistently
  + **Action: Add to Agenda for Spring 2019 meeting a topic to review and produce this SM&C Glossary of Terms.**
* Olivier Churlaud gave a presentation on CNES’s ISIS Services and actual use cases of MO features.
* Adrian Tinio/JPL presented the status of the MO Shadow Project done with ESA. Parameter and aggregate services working well, but note that it was ESA software running on both ends. Would like to see a higher-level set of support libraries.

# Day 2. Tuesday October 16, 2018

**Tuesday morning:**

* The morning was spent working on the latest draft of the green book.

**Action: Provide update to GB by the end of the year**

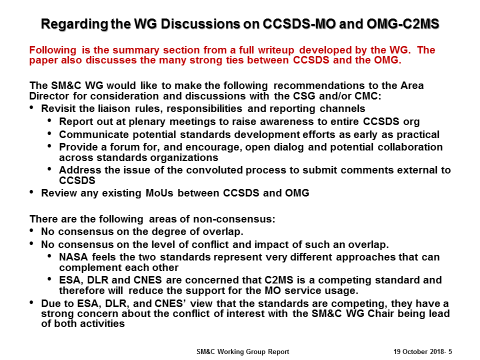
**Tuesday afternoon:**

* Joint meeting was held with the Security WG to discuss some work performed by ESA reviewing the current security concept in the MO framework. The current security limitations were shown and discussed and a report on work performed by an ESA intern were shown that detailed an approach that would give application level security in the MAL.
* SecWG is going to provide inputs to the WG that will firstly detail the current limitations which it was felt would be best placed in the MO Reference Model (currently being updated), and secondly list the changed required to the current book set to support the application level security.
* The current MO Reference model updates were reviewed, minor changes and clarification were suggested.
* The last part of the day was spent discussing the idea of a MO based Gateway project/mission between separate agencies/organizations. Strong interest from the WG members to participate in this. A rough list of concepts/requirements/suggestions for an interface gateway was developed for future use.

# Day 3. Wednesday October 17, 2018

**Wednesday morning:**

* Tiago gave a small presentation on the first draft of the File services book. A good discussion on the services took place, the group wanted to ensure the two services were agnostic of location (so for use ground-ground, ground-space, and space-space) and also agnostic of protocols used for transfer (so CFDP to space, SFTP for ground, or CSS TFTS for ground stations).
* ESA and DLR have committed to provide resources for this project.
* **Action: Provide updated draft file services specification by 1st April 2019**
* **Action: Set up joint meeting with CSS in Spring 2019 meeting to discuss file services**
* Several hours were spent discussing concerns raised by CNES, DLR, and ESA regarding technical overlaps between CCSDS-MO and the OMG-C2MS standards.
  + Dan gave the current status of the C2MS progress in OMG. It has been voted on by both their Architecture Board and their full membership, technical comments have been received are now being worked on, and final publication is expected in early 2019.
  + The WG felt that since it was clear that the C2MS standard is moving forward that there was no purpose in the SM&C WG trying to get it stopped.
  + The overlap paper was not reviewed or updated and is not considered a product of the WG.
  + Mario clarified the situation with the TN being sent to OMG, and the concern that the liaison process had failed in this case.
  + Dan explained the heritage of C2MS, how it was derived from the NASA Goddard GMSEC product
  + Dan explained that OMG, driven by US industry, had requested the standardisation of C2MS.
  + Large discussion on the nature of the overlap.
  + Discussion on the OMG process and how they differ from CCSDS processes. Dan pointed out that it is important to respect the rules of both organizations.
  + Concern was raised that these two standards, where some members of the WG see significant overlap and conflict, originate from the same source in that Dan Smith is involved in leadership of both MO and C2MS. Dan pointed out that every person in SM&C comes with the background of their home organization and their own built-in assumptions and biases.
  + Mario, Nestor, Margarita, and Brigitte left to allow the WG to formulate its view and recommendation to the AD.
  + A 2-page paper was then developed that described the concerns, recommended actions, and continued areas of non-concurrence.
    - In particular, there continues to be disagreement (non concurrence) on the level of overlap and also on the impact of the overlap on users of MO.
    - Primary actionable recommendation was to formalize the role and duties of the liaison. Several detailed suggestions were made.
  + Following is the summary chart provided to the Area Director.



**Wednesday afternoon:**

* Joint meeting was held with DTN. Keith Scott gave an overview of DTN, its purpose, how it works, and its intended use. Sebastian Martin from ESA gave a small presentation of ESA’s deployment of MO over DTN (this is a proprietary internal implementation and specification). A constructive discussion on the idea of developing a specification of binding MO over DTN, ESA has expressed strong interest in supporting this work, a second agency is required.
* **Action: Find a second Agency (besides ESA) for supporting the binding to DTN**
* Continued WG discussion on C2MS/MO overlap
* Last part of Green Book was reviewed by the WG completing the current review cycle for it in the WG.
* Automation. Short discussion on the Automation service currently listed as a draft project. The WG felt that it may make more sense to move the project to the MPS WG as the original concept of MO had the services (Planning, Scheduling, and Automation) strongly linked. However it is noted that MPS is currently very focused and busy with work on their current planning standard and therefore the WG felt that there is no hurry to do this.

# Day 4. Thursday October 18, 2018 (1/2 day)

**Thursday morning:**

* No SM&C WG meetings. However the main group attended the MPS WG meeting to observe but also provide support in their development of their services.

**Thursday afternoon:**

* WG did not meet except for Joint meeting with SAWG and SOIS:
  + Presentation by Roger Thompson to the group giving the SAWG’ work on their implementation view for the MO software stack.
  + Ramon Krosley presented a similar view for SOIS.
  + Constructive discussion on the relationship between the two standardisation efforts. Conclusion was that:
    - Original MoU still stands in general concept
    - Recent Yellow book from SOIS still has a number of unanswered comments in it
    - Peter Shames volunteered to review outstanding comments to see if, in light of the discussions, they were still relevant and if any small changes could be made to close them out.
  + SAWG will continue to develop their views forward and further refine them.

# Day 5. Friday October 19, 2018 (1/2 day)

* Updates were made in CWE to the schedule dates and status for each of the active projects.
* New or draft projects were updated and requests sent to the Area Director for approval as new active projects.
* The week was reviewed and summary charts were prepared for the Area Director and the MOIMS Plenary scheduled for Friday afternoon. There was consensus that it had been a very productive week.
* A new item was brought forward with regards to the OMG discussions. “Due to ESA, DLR, and CNES’ view that the standards are competing, they have a strong concern about the conflict of interest with the SM&C WG Chair being lead of both activities.” It was agreed to include the text, unchanged, under the non-concurrence section of the report to the Area Director.
* We are looking forward to May 6-10, 2019 in Mountain View, California.

# ACTIONS

**Spring 2018 Action Item List**

**October 2018 Status Updates**

**\*\* all actions from Spring 2018 are now closed \*\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ID** | **ACTION** | **ASSIGNED TO** | **DUE** | **NOTES** | **STATUS** |
| 20171109-2 | Begin process to release HTTP prototype as open source | Brian Giovannoni/NASA | 12/15/15 start | Goal of April 2018 release. 12Apr18 AWAITING JPL STATUS | Released!. GitHub.com/NASA, search for CCSDS. MAL HTTP Transport. CLOSED 10/15/2018 |
| 20171109-5 | Comment on SOIS Yellow Book within 30 days of its release | All | TBD |  | CLOSED. Comments submitted, awaiting response |
| 20171109-7 | Review updated Green Book | All | 11/30/2017 | 12Apr18: Awaiting next update. | In progress. CLOSED |
| 20180413-1 | Complete C++ API Doc | D. Smith | 24 Apr 2018 | Requires update from Dominique and review from Sam. | CLOSED, agency review now completed |
| 20180413-2 | Review XTCE Green Books to determine whether changes are needed | K. Rice / NASA | 13 May 2018 | Will then Confirm, or open project to update documents | CLOSED, will need updates |
| 20180413-3 | Submit comments on draft LOP-G recommended standards document | All | 15 May 2018 | HARD DEADLINE! | CLOSED. Done. |
| 20180413-4 | Describe ideas for posting of open source software from multiple agencies | O. Churlaud | 13 May 2018 |  | CLOSED |
| 20180413-5 | Update the SM&C mailing list per the updates provided at the NIST meeting | D. Smith | 24 April 2018 |  | CLOSED |
| 20180413-6 | Discuss concepts and need for a mapping of MO onto DTN as a transport layer | S. Cooper | 15 July 2018 |  | CLOSED, joint meeting set for Berlin |
| 20180413-7 | Determine your agency’s interest in committing to work on File Management Services. | ESA, TBD | 1 July 2018 |  | CLOSED |
| 20180413-8 | Determine your agency’s interest in committing to work on Automation Services. | All | 1 July 2018 |  | CLOSED |
| 20180413-9 | Update the MO Reference Model Book (5 yr update) | S. Gartner | 1 July 2018 |  | CLOSED, updates presented in Berlin |
| 20180413-10 | Determine your agency’s interest in committing to work on 5 yr update to the JAVA MAL API. | All | 1 June 2018 |  | CLOSED, covered under DOC status |
| 20180413-11 | Post any MAL and JAVA API RIDs on github | All | 1 July 2018 |  | CLOSED, done |
| 20180413-12 | Discuss cFS-MO adapter with SOIS team | D. Smith | 1 June 2018 |  | CLOSED, covered by latest discussions on how SOIS and MO work on board. |

**Fall 2018 Action Item List**

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| --- | --- | --- | --- | --- | --- |
| **ID** | **ACTION** | **ASSIGNED TO** | **DUE** | **NOTES** | **STATUS** |
| **2018-1019-1** | Contact Jonathan Wilmot for LOP-G access ideas, since SOIS has been very successful. | Dan Smith | 1/1/2019 |  |  |
| **2018-1019-2** | Request AD to start poll for MAL BB reconfirmation. | Sam Cooper | 12/30/2018 |  |  |
| **2018-1019-3** | JAVA API - Find single agency to do the work. | All | 1/31/2019 |  |  |
| **2018-1019-4** | Add to Agenda for Spring 2019 meeting a topic to review and produce this SM&C Glossary of Terms. | Dan Smith | 2/15/2019 |  |  |
| **2018-1019-5** | Provide update to the MO GB by the end of 2018 | Sam Cooper | 12/3/2018 |  |  |
| **2018-1019-6** | Provide updated draft file services spec | Tiago Nogueira | 4/1/2019 |  |  |
| **2018-1019-7** | Find a second Agency (besides ESA) for supporting the binding to DTN | All | 2/15/2019 |  |  |
| **2018-1019-8** | Set up joint meeting with CSS in Spring 2019 meeting to discuss file services | Dan Smith | 2/15/2019 |  |  |
| **2018-1019-9** | Coordinate approval of new projects for 5-yr revision of MO Reference Model MB, XTCE GB, XTCE Element Description GB, and MO File Management Services BB. | Dan Smith | 11/1/2018 | Projects were approved at the October 24, 2018 CMC meeting | CLOSED |

**[This page was not discussed in the October 2018 Berlin meetings, but is included here as a reminder of the roadmap the SM&C WG agreed to.]**

**SM&C Roadmap**

**Updated at the NIST Meetings in Gaithersburg, Maryland USA**

**April 9-13, 2018**

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