

# CCSDS Mission Planning & Scheduling WG Spring Meeting 2024

## Attendants:

Peter van der Plas (ESA, chair)  
Cesar Coelho (ESA, SM&C WG)  
Cheol Hea Koo (KARI)  
Christoph Lenzen (DLR)  
Clement Hubin-Andrieu (CNES)  
David Frew (ESA)  
Evidiki Ntagiou (ESA, by WebEx)  
Geoffrey Lochmaier (NASA)  
Guillermo Buenadicha (ESA)  
Jung-Hyun Lee (KARI)  
Maria Wörle (DLR)  
Marvin Wittschen (DLR, by WebEx)  
Matthew Dailis (NASA)  
Olly Page (UKSA)  
Quinten Van Woerkom (ESA, by WebEx)

## Agenda

Date	Time	WG	Topics
Mon 29 April	08:45 – 09:45 EDT	CCSDS	CCSDS Opening Plenary
Mon 29 April	09:45 – 10:45 EDT	MOIMS	MOIMS Area Plenary
Mon 29 April	10:45 – 12:30 EDT	MP&S	<u>WG day #1 morning session</u> <ul style="list-style-type: none"><li>- Welcome and agenda</li><li>- Blue Book status and feedback</li></ul>
Mon 29 April	13:30 – 17:00 EDT	MP&S	<u>WG day #1 afternoon session</u> <ul style="list-style-type: none"><li>- Blue Book review, discussion of preliminary RIDs</li></ul>
Tue 30 April	08:45 – 12:30 EDT	MP&S	<u>WG day #2 morning session</u> <ul style="list-style-type: none"><li>- Blue Book review, discussion of preliminary RIDs</li></ul>
Tue 30 April	13:30 – 17:00 EDT	MP&S	<u>WG day #2 afternoon session</u> <ul style="list-style-type: none"><li>- Blue Book review, discussion of preliminary RIDs</li></ul>
Wed 1 May	08:45 – 12:30 EDT	MP&S	<u>WG day #3 morning session</u> <ul style="list-style-type: none"><li>- File Formats Prototyping: test specification, test execution and reporting</li><li>- Yellow Book (File Formats) finalization</li></ul>

Wed 1 May	13:30 – 17:00 EDT	MP&S	<u>WG day #3 afternoon session</u> - Magenta Book Project kick-off, draft book overview, next steps
Thu 2 May	08:45 – 12:30 EDT	MP&S SM&C	<u>WG day #4 morning session</u> - Services Prototyping: test specification, prototype implementation, test execution and reporting - Yellow Book (Services) finalization
Thu 2 May	13:30 – 17:00 EDT	MP&S	<u>WG day #4 afternoon session</u> - Green Book (Issue 2) Project kick-off, discussion, next steps
Fri 3 May	08:45 – 12:00 EDT	MP&S	<u>WG day #5 morning session</u> - Blue Book review, discussion of preliminary RIDs - Reporting to MOIMS
Fri 3 May	16:00 – 17:00 EDT	MOIMS	MOIMS Area Closing Plenary

## MoM

Day #1: Monday 29<sup>th</sup> April 2024, 10:45 to 17:00

Agenda: Welcome and agenda  
Blue Book status and feedback  
Blue Book review, discussion of preliminary RIDs

### Minutes

#### **General**

Roger has now stepped down from his role as Book Editor. He will still be available in the near term to provide his support to the WG, but with limited involvement. Quinten has now taken over the role as Book Editor, in agreement with the WG.

#### **RID discussion**

Peter presented the RID form, expected to be similar as the one that will formally be provided by the CCSDS Secretariat during the Agencies Review.

The version of the Blue Book for AR is that of 25<sup>th</sup> of March (although the CCSDS Secretariat may perform some editorial changes). This version contains some editorial updates requested by the CCSDS Chief Editor on the use of requirement styles.

In addition, a temporary update of the Blue Book and the XML Service Specification has been performed for the invalid error numbering (counting from 0 instead of 1). This is an internal fix and will not be in the AR version. Peter to raise this as an AR RID **[ACTION]**.

Disposal and discussion of some RIDs from Peter. The consolidated RID table is here:

[https://drive.google.com/drive/folders/1ptB-2mQiTw5etkWLCqvSVdnPHXG\\_H-a?usp=sharing](https://drive.google.com/drive/folders/1ptB-2mQiTw5etkWLCqvSVdnPHXG_H-a?usp=sharing)

Day #2: Tuesday 30<sup>th</sup> April 2024, 08:45 to 17:00

Agenda: Blue Book review, discussion of preliminary RIDs

### Minutes

#### **RID discussion**

Quinten's major RIDs were discussed in the morning. DLR's RIDs were discussed in the afternoon. See the RID table in the Google Drive (link above) for the details.

#### **WG agreements**

Patch plans are entities that generate target plans, that are the entities returned in queries and other operations. The patch plan itself is not mandatorily persisted.

A patch plan fields, if different to the precursor plan, prevail (originator) (implementation 1). Alternatively, it could be accepted by agreement that if fields are different the patch is rejected.

A patch plan generates a new plan (target), not necessarily a new version of the precursor. It tells the target plan explicitly. Instead, the Plan Edit Service generates a new version of an existing plan.

#### **Test Spec changes**

Changes in the Patch Plans P3 and P4 to ensure that they create new target plans. So, if a Patch Plan has been applied, the target plan will exist.

#### **Questions to Roger**

To add a note to the query of a patch plan that items "contained" are items to be added or to be removed. Planning systems are not bound to keep historic plans. To be checked with Roger.

Day #3: Wednesday 1<sup>st</sup> May 2024, 08:45 to 17:00

Agenda: File Formats Prototyping: test specification, test execution and reporting  
Yellow Book (File Formats) finalization  
Magenta Book Project kick-off, draft book overview, next steps

## Minutes

### **Yellow Book (File Formats) discussion**

Quinten presented the latest Yellow Book on the File Formats and Data Types prototyping. DLR has now committed to support the XML based prototyping as second Agency. As a start point, DLR will take a few test cases from Quinten and will try to implement these independently.

Discussion on how to conduct the xml file comparison in the case of different ordering of arguments or parameters in the ESA and DLR implementation. Use of specific tools (XML Spy, others) could be a way forward.

Discussions on how to ensure that the path from BB, EA, service specs and the file schemas consistency can be obtained. As priority, first to get at least a way to check consistency between file format schemas and service specification.

Second priority lesser urgency, seek how to generate the file format schema automatically from the Blue Book (macros, or something else) not from EA. Lowest priority is also to get rid of EA, finding an alternate way to generate the UML diagrams.

[**ACTION**] Peter to check how to ensure that attachments can be delivered with the Yellow Book (more evident in the PDF format, but not sure in the Word). Some products will be made available in a repository though (test logs, others).

Peter presented the CCSDS processes and schedule for new project approvals. A Magenta Book project on the MP&S Information Model has been submitted now. In addition, a new project for the 5-year revision of the Green Book has been submitted.

The Magenta Book is available in the Google Drive under Roger's handover. A dedicated directory for the Magenta Book project will be created. Note that the Google Drive may require a general overhaul, to better structure all information.

[**ACTION**] Peter to raise a RID on the identity in the MPSSystemConfigDetails (remove it, but first check with Roger why it is done this way).

Agreement to replace Roger's style in the BB without numbering one with numbering, adding the words 'Data Type: and the table or diagram for the data type is preceded with text put as an Overview and then Definition for the table for the data type. A section for "Requirements" may follow, but it is optional.

Same approach to be followed for services and service operations. This issue is reported already as a RID by Peter. As such, this discussion should be reflected in the RID disposition.

### **Test specs changes**

Modifications in the Yellow Book v14, including the MPSSystemConfiguration data and the T\_PIMS\_009 test.

### **Questions to Roger**

Roger to try to remember why we do have the validity fields in the Planning requests (validityTime and validityEvent), and why this is not handled as constraints.

Ask Roger why he put in the MPSSystemConfigDetails an identity, turning it into an MO Object. This may result in a RID on the current Blue Book.

Day #4: Thursday 2<sup>nd</sup> May 2024, 08:45 to 17:00

Agenda:            Services Prototyping: test specification, prototype implementation, test execution and reporting  
                      Yellow Book (Services) finalization  
                      Green Book (Issue 2) Project kick-off, discussion, next steps

### Minutes

Attendance of the MP expert from the SM&C WG (Cesar) for the Services Prototyping.

### **Document generation**

Cesar presented an autogenerated document (using a specific tool with the xml file as input), to be proposed for the Blue Book generation. In the next months, the WG will evaluate the proposal of autogenerated document presented by Cesar, and check if the current benefits and shortcomings of the tool. Some more features could potentially be added if needed.

### **Directory Service**

[**ACTION**] Peter to raise a RID that the Directory Service section (3.1.2) is to be removed from the BB (and Magenta Book) (no longer needed, as non-service-based information is not supported by the MAL).

### **Yellow Book (Services) discussion**

It was agreed that the Yellow Book will be split in two volumes: one on the File Formats testing and one on the Service based testing. The current Yellow Book contains a mix of both. As such, a version prior to the branching of the book shall be used for the Services Yellow Book. The following updates to be made:

- Section 1: from template, some text still to be added.

- Section 2: stays. Quinten will work on his volume, on the data types and information model. The same shall be done for the services, where the PICS table shall be added with the service operations and the test results.
- Section 3: stays. Add the list of data types that are implicit to the service tests. Check Quinten's excel table that should contain that. In addition, a subset of the data types is covered (only those specific to the services). PICS Test Coverage (forward traceability) shall be added. This can be here or in section 4 (but better in section 3).
- Section 4: to be streamlined.
- Section 6: tests to be found in the spreadsheet. That shall in an annex, and in the pdf to add the excel as embedded.
- Section 7: add test reports as annex. Replace title with: "Test Results".

**[ACTION]** Guillermo to update the Yellow Book (Services) accordingly. Also to request from ESA and from DLR a one pager on the prototyping framework (use of common GIT repositories, tools, others).

**[ACTION]** Peter to provide to Quinten and Guillermo the latest applicable template of the Yellow Book from the CCSDS Secretariat. Also to check the differences in styles between the current YBs and the official one.

**[ACTION]** Peter to check the publication process for a Yellow Book. Will it be stored on the CCSDS website or is it the responsibility of the WG (and provide it for example in the CWE)? Can we get the document numbers? Can we provide the PDF (with attachments), or do we always have to provide the Word version to the CCSDS?

### **Green Book update**

Section 5 contains gathered use cases from 2016. Should it be removed? No. Guillermo mentioned the missing use cases of human mission. As such, section 5 may add new use cases. Peter also mentioned that section 4 could be revisited with new mission planning concepts and technology.

Sections 6 and 7 must be updated to reflect the standard. A caveat must be added to them (6 and 7), to highlight that there may be use cases and concepts in sections 4 or 5, not yet covered by the blue book. This could be in a new section.

Section 8 may disappear (no roadmap required). Instead, a new section about the overview of the standard could be added. This section shall refer to the new Magenta Book as well. It would also serve as a guide how to use and better understand the BB. And where to find additional resources (for example in GIT), such as prototypes, reference implementations (also for the MAL), examples, etc.

There is a possible synergy to the interoperability standard for Ground Stations (902x1b1c1.pdf, CROSS SUPPORT SERVICE MANAGEMENT— SIMPLE SCHEDULE FORMAT SPECIFICATION RECOMMENDED STANDARD CCSDS 902.1-B-1 BLUE BOOK May 2018). MP&S could be more specific how to interface/align/embed.

## Test spec changes

How to trigger INVALID cases, such that the error response can be tested.

TimeWindow and EventWindow should have a requirement that that the end shall not be before the start time. Peter to create a RID on the Blue Book [**ACTION**].

Discussion on the error codes, how to handle the secondary codes and the INVALID codes. All INVALID codes are dealing with invalid input data. The secondary code is mandatory. There seems to be an issue with the current MAL code, as it does not provide the correct C++ code for the INVALID error code (MAL Pair). Cesar will investigate and provide an update of the MAL if needed.

[**ACTION**] Guillermo to adapt the Test Specification to always specify the INVALID index and secondary error code.

[**ACTION**] Peter to raise a RID: For all PubSub, the INVALID shall be removed.

## Questions to Roger

To Roger, but also to Cesar and SM&C, question if the version in an ObjectRef can be nulled? It I stated on page E3 of the book: Version is optional for the objectID. Area and Type can be omitted. Version can be omitted where the latest or current version is assumed.

To Roger: what is the difference between "current" and "latest"? Is this reference ambiguous? What if the version is nulled? However, in the MAL type (of the XML File Schemas) it states that the version is mandatory. Is there an inconsistency?

Depending on Roger's answer a RID may be required.

Day #5: Friday 3<sup>rd</sup> May 2024, 08:45 to 12:00

Agenda:       Blue Book review, discussion of preliminary RIDs  
                  Reporting to MOIMS

## Minutes

The presentation for the MOIMS plenary was created jointly by the WG.

Discussion and agreement on the bullet input for the Lunar Interoperability forum of following week.

The next WG meeting will be held by WebEx on

## Summary of actions:

1. **Peter** to raise an AR RID: a temporary update of the Blue Book and the XML Service Specification has been performed for the invalid error numbering (counting from 0 instead of 1).
2. **Peter** to check how to ensure that attachments can be delivered with the Yellow Book.
3. **Peter** to raise a RID that the Directory Service section (3.1.2) is to be removed from the BB (and Magenta Book).
4. **Guillermo** to update the Yellow Book (Services).
5. **Peter** to provide to Quinten and Guillermo the latest applicable template of the Yellow Book.
6. **Peter** to check the publication process for a Yellow Book.
7. **Peter** to create a RID on the Blue Book: TimeWindow and EventWindow should have a requirement that that the end shall not be before the start time.
8. **Guillermo** to adapt the Test Specification to always specify the INVALID index and secondary error code.
9. **Peter** to raise a RID: For all PubSub, the INVALID shall be removed.

General due date for all actions is 31 May 2024.

## Next meeting:

Next WG meeting will be on Tuesday **4 June 2024**, 16:00 – 18:00.

Next Prototyping splinter will be TBD (in advance of the WG meeting), to be organized by Dominik.

## Attachments:

None.