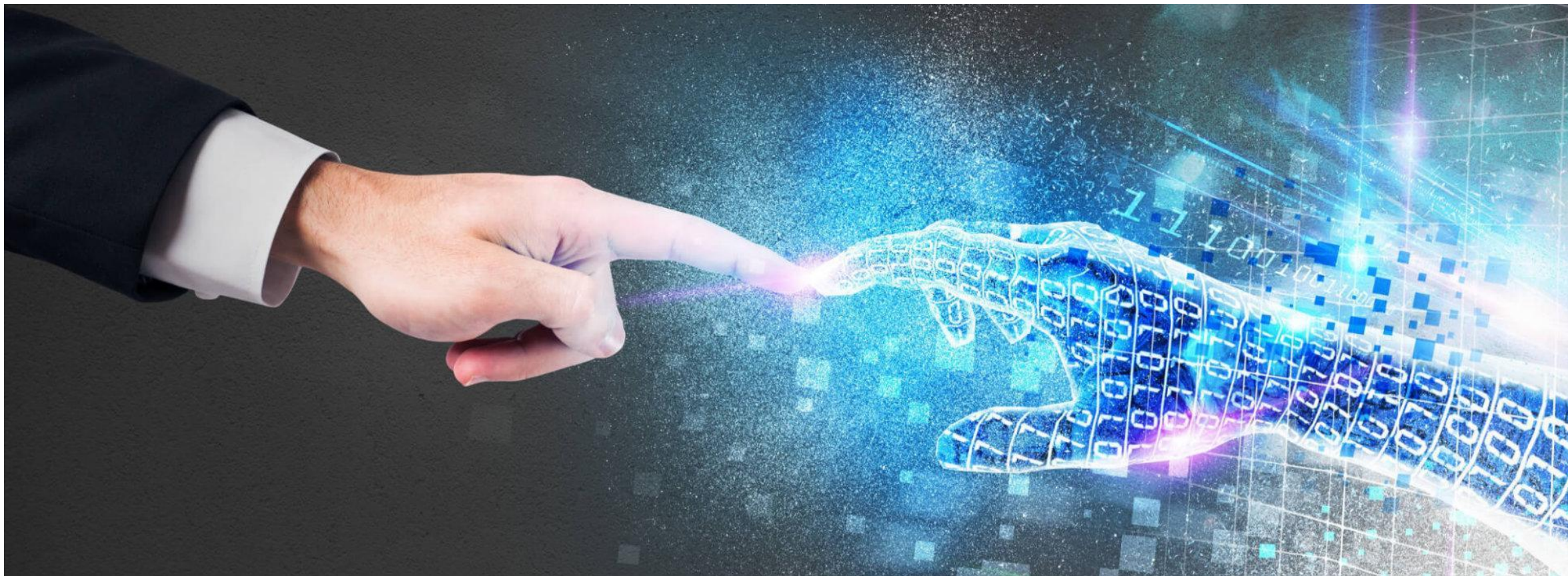


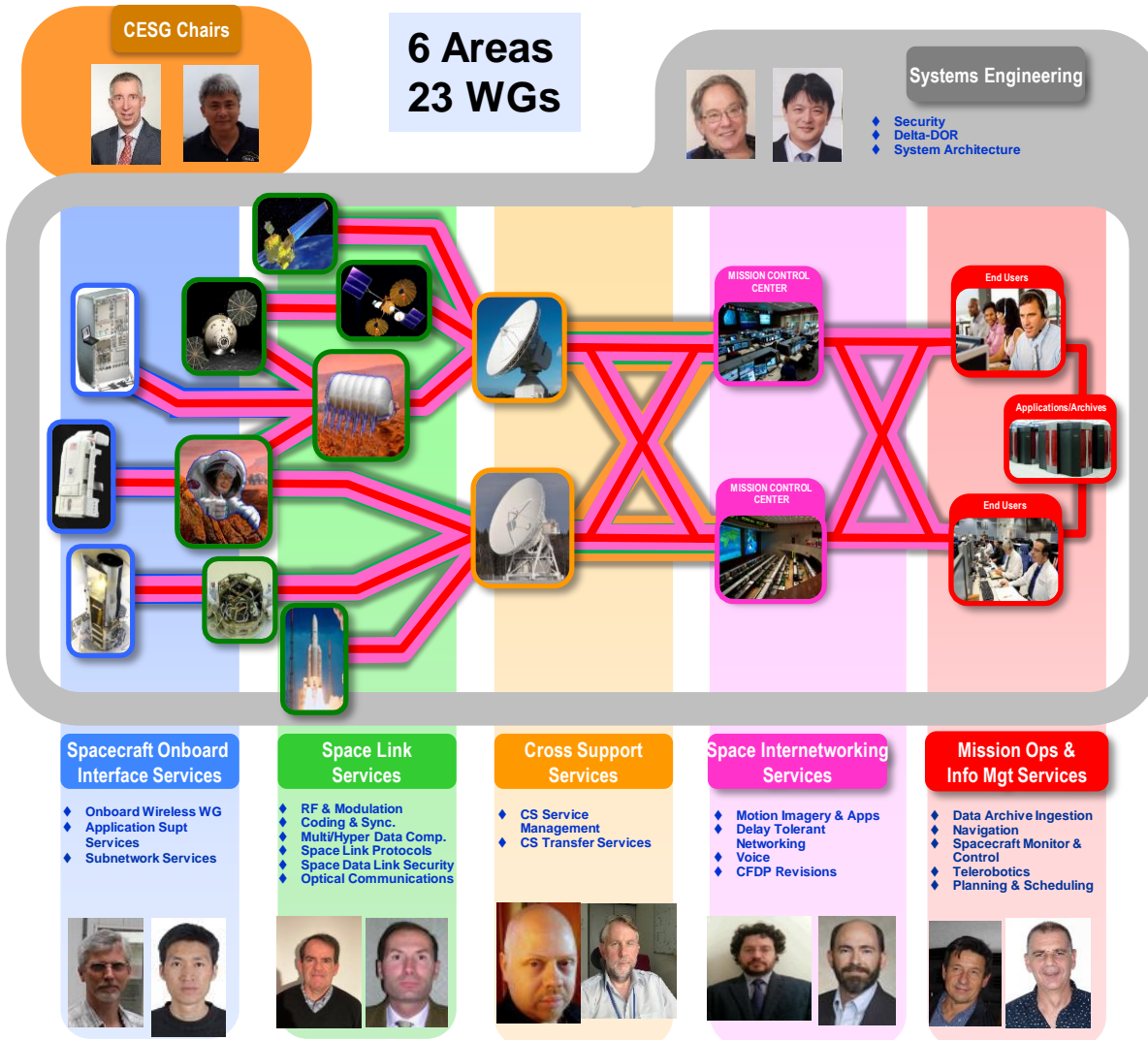
Fall 2021 Virtual CCSDS Technical and CESG Meetings



21 October 2021
14:00UTC

Time (UTC)	Duration	Topic	Presenter
14:00	5 minutes	Welcome	Sami Asmar – CCSDS General Secretary
14:05	10 minutes	Introduction	Klaus-Juergen Schulz – CESG Chair
14:15	10 minutes	Role of the CESG	Peter Shames – SEA Area Director
14:25	10 minutes	MOIMS Workplan	Mario Merri – MOIMS Area Director
14:35	10 minutes	SIS Workplan	Tomaso de Cola – SIS Area Director
14:45	10 minutes	SLS Workplan	Ignacio Aguilar – SLS Area Director
14:55	10 minutes	SOIS Workplan	Jonathan Wilmot – SOIS Area Director
15:05	10 minutes	CSS Workplan	Erik Barkley – CSS Area Director
15:15	10 minutes	SEA Workplan	Peter Shames – SEA Area Director
15:25	5 minutes	Code of Conduct	Michael Blackwood - Secretariat
15:30	5 minutes	Spring 2022 Meetings	Michael Blackwood - Secretariat
15:35		Adjournment	Klaus-Juergen Schulz – CESG Chair

Members of the CESG



CESG Chair
Deputy

K.-J. Schulz
Timothy Pham

SE Area Director
Deputy

Peter Shames
Hiroshi Takeuchi

MOIMS Area Director
Deputy

Mario Merri
Marc Duhaze

CSS Area Director
Deputy

Erik Barkley
Colin Haddow

SLS Area Director
Deputy

Ignacio Aguilar Sanchez
Gilles Moury

SIS Area Director
Deputy

Tomaso de Cola
Rodney Grubbs

SOIS Area Director
Deputy

J. Wilmot
X. He

Blue Books – Recommended Standards

- **CCSDS 231.0-B-4, TC Synchronization and Channel Coding, July 2021**
- **CCSDS 509.0-B-1 Cor. 1, Technical Corrigendum 1 to CCSDS 509.0-B-1, Issued February 2018**
- **CCSDS 505.0-B-2, XML Specification for Navigation Data Messages, May 2021**

Magenta Books – Recommended Practices

- **None**

Orange Books

- **CCSDS 131.31-O-1, CCSDS Space Link Protocols over ETSI DVB-S2X Standard, September 2021**
- **CCSDS 131.21-O-1, Serially Concatenated Convolutional Codes—Extension (SCCC-X), May 2021**

Green Books – Informational Reports

- **CCSDS 660.1-G-2, XML Telemetry and Command Exchange (XTCE)-Element Description, August 2021**
- **CCSDS 720.1-G-4, CCSDS File Delivery Protocol (CFDP)—Part 1: Introduction and Overview, May 2021**
- **CCSDS 720.2-G-4, CCSDS File Delivery Protocol (CFDP)—Part 2: Implementers Guide, May 2021**

Authorisation to publish

- **CCSDS 732.1-B-2, Unified Space Data Link Protocol (Blue Book, Issue 2)**
- **CCSDS 732.0-B-4, AOS Space Data Link Protocol (Blue Book, Issue 4)**
- **CCSDS 232.0-B-4, TC Space Data Link Protocol (Blue Book, Issue 4)**
- **CCSDS 230.1-G-3, TC Synchronization and Channel Coding—Summary of Concept and Rationale (Green Book, Issue 3)**
- **CCSDS 132.0-B-3, TM Space Data Link Protocol (Blue Book, Issue 3)**

Agency Reviews

- **CCSDS 876.0-P-1.1, Spacecraft Onboard Interface Services-XML Specification for Electronic Data Sheets**
- **CCSDS 131.0-P-3.1, TM Synchronization and Channel Coding**
- **CCSDS 131.2-P-1.1, Flexible Advanced Coding and Modulation Scheme for High Rate Telemetry Applications**
- **CCSDS 414.1-P-2.1, Pseudo-Noise (PN) Ranging Systems**
- **CCSDS 653.0-R-1, Information Preparation to Enable Long Term Use**
- **CCSDS 355.0-P-1.1, Space Data Link Security Protocol**
- **CCSDS 502.0-P-2.1, Orbit Data Messages (Pink Book, Issue 2.1)**

Approval of new Projects

New Projects of the SEA Area

- **Secure Software Engineering for Space Missions - Magenta Book**

New Projects of the SLS Area

- **Robust Compression of Fixed-Length Housekeeping Data Packets - Summary of concept and rationale - Green Book**
- **Space Data Link Security Protocol--Summary of Concept and Rationale - Issue 2 - Green Book**
- **Pseudo-Noise (PN) Ranging Systems - Issue 3 - Blue Book**
- **Simultaneous Transmission of GMSK Telemetry and PN Ranging - Issue 2 - Green Book**

New Projects of the MOIMS Area

- **Navigation Data Messages Overview Green Book (V.3) - Green Book**

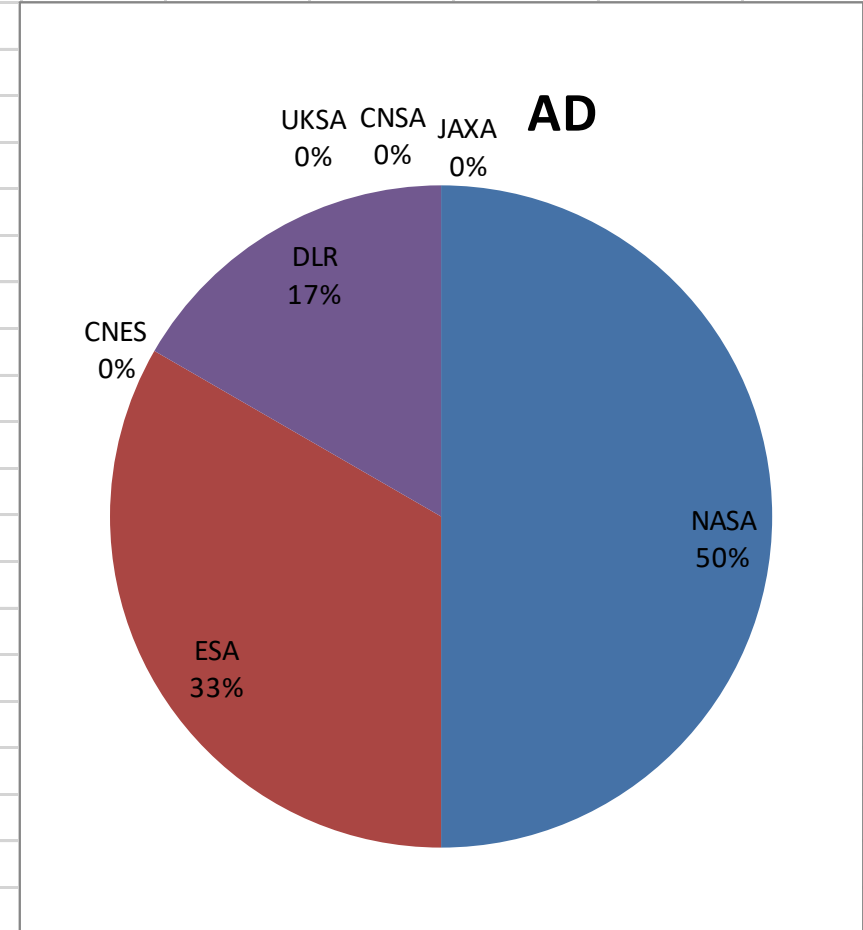
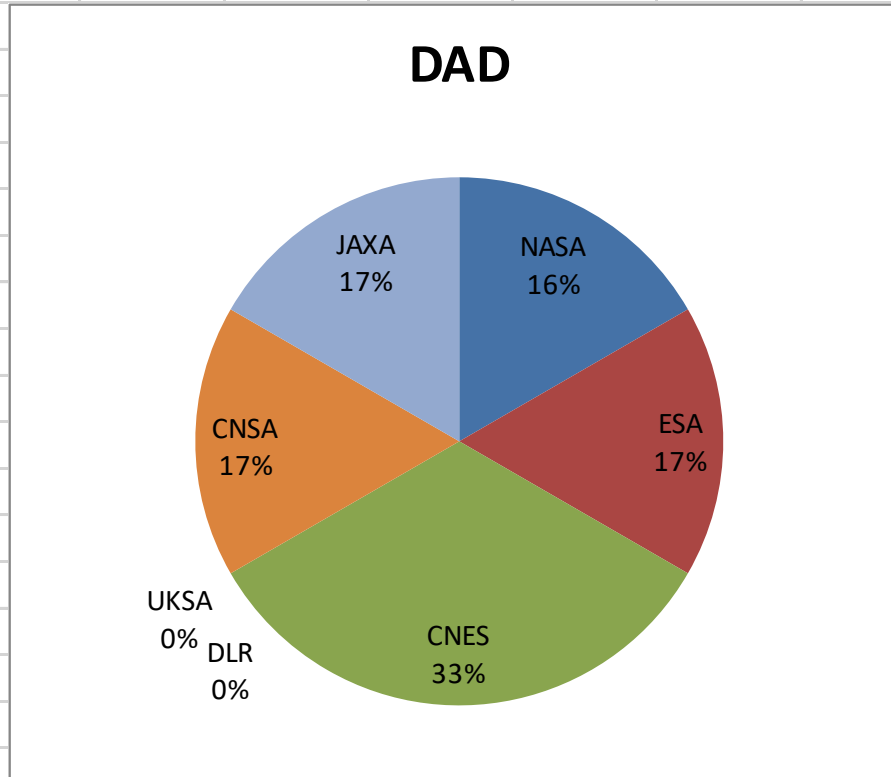
New Appointments

- **Appointment of new SLS Area Director: Ignacio Aguilar Sanchez (ESA)**
- **Appointment of new SIS Area Director: Tomaso de Cola (DLR)**
- **Appointment of new Deputy SIS Area Director: Rodney Grubbs (NASA)**

- **(CESG Poll) Appointment of new SIS CFDP Working Group Chair: Felix Flentge (ESA)**

Area Directors / Area Directors Overview

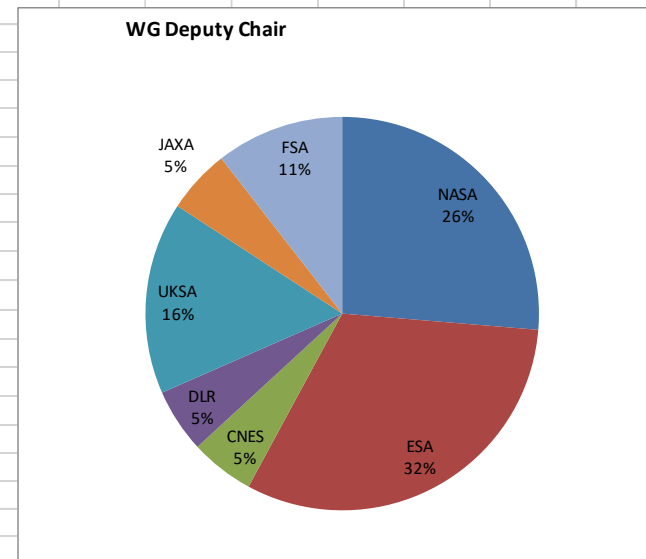
	AD	DAD
NASA	3	1
ESA	2	1
CNES		2
DLR	1	
UKSA		
CNSA		1
JAXA		1
Total	6	6



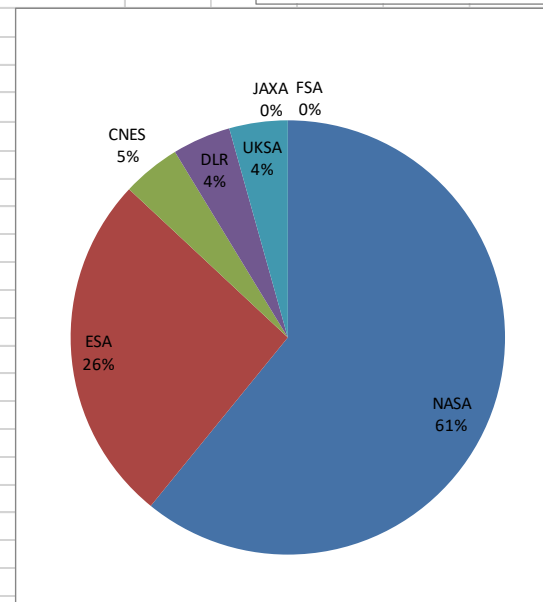
WG Chair / Deputy Chair Overview

Area	WG	C	Co
SEA	SA	NASA	0
SEA	Security	NASA	ESA
SEA	Time	NASA	ESA
SEA	D-DOR	ESA	0
MOIMS	DAI	UKSA	NASA
MOIMS	NAV	NASA	ESA
MOIMS	SM&C	ESA	NASA
MOIMS	MP&S	ESA	CNES
CSS	SM	NASA	ESA
CSS	CSTS	ESA	0
SOIS	APP	NASA	UKSA
SOIS	WIR	NASA	FSA
SOIS	SNW	NASA	ESA
SLS	RFM	ESA	NASA
SLS	C&S	ESA	NASA
SLS	MHDC	NASA	0
SLS	SLP	NASA	UKSA
SLS	SDLS	CNES	NASA
SLS	OPT	NASA	ESA
SIS	MIA	NASA	DLR
SIS	DTN	NASA	JAXA
SIS	VOICE	DLR	FSA
SIS	CFDP	NASA	UKSA

	WG Chair	WG Deputy Chair
NASA	14	5
ESA	6	6
CNES	1	1
DLR	1	1
UKSA	1	3
JAXA	0	1
FSA	0	2
Total	23	19

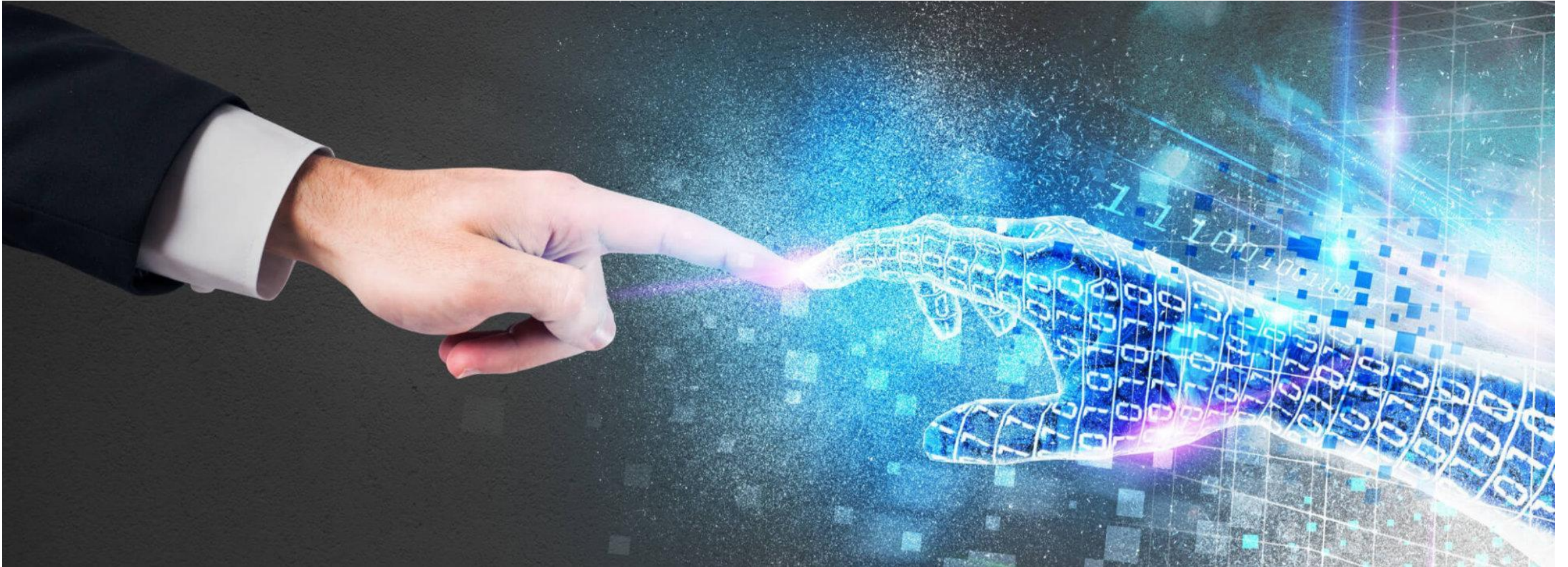


WG Chair

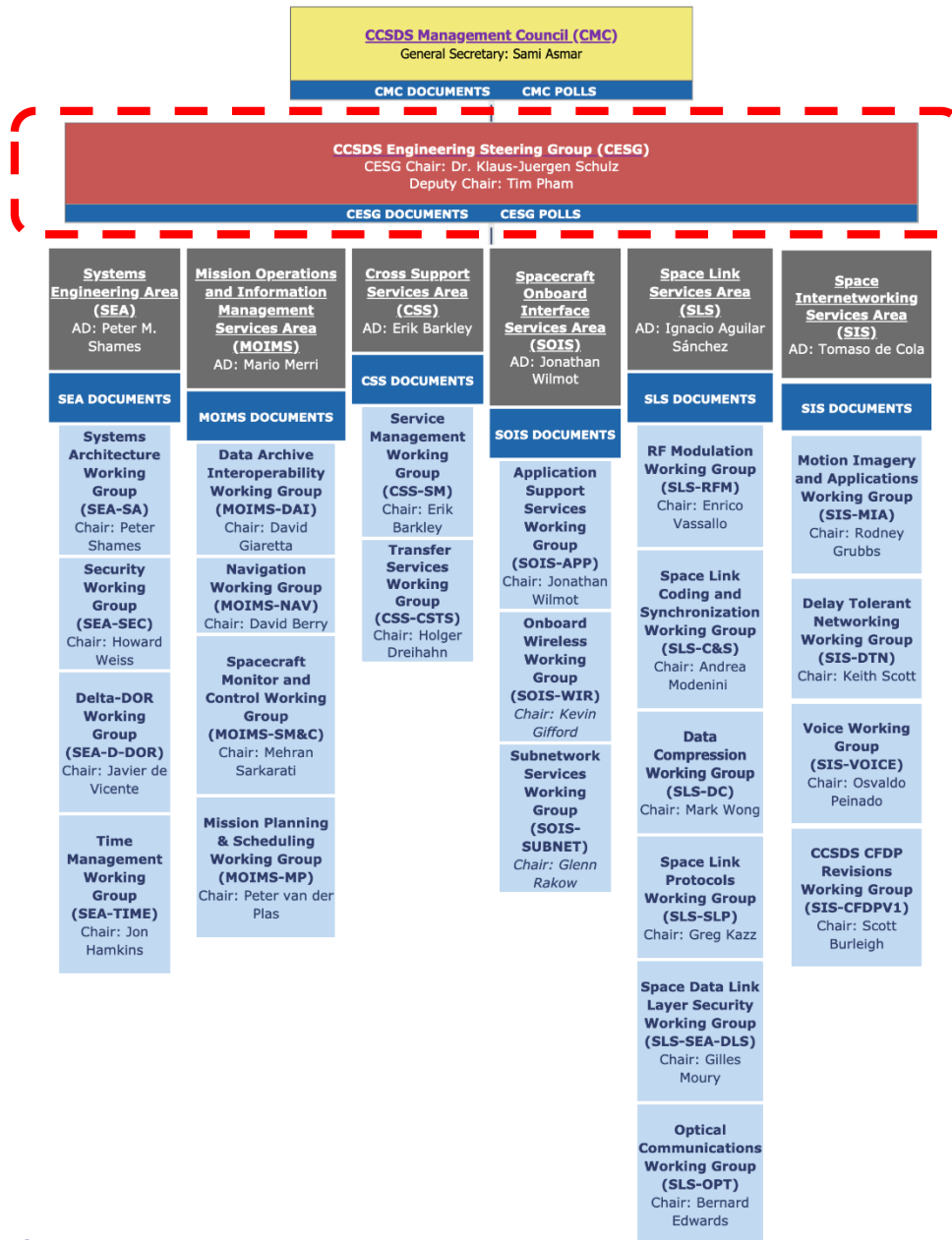


Fall 2021 Virtual CCSDS Meetings

Role of the CESG



CCSDS Technical Organization



CCSDS Engineering Steering Group

- CESG Chair and Deputy
- 6 Area Directors & Deputies
- Review and approve documents for technical content (and other criteria)

CCSDS Working Organization

- 6 areas of work
- Total of 22 Working Groups (Fall 2021)
- Create projects & produce documents

But ... just what does the CESG do?

- **“The CCSDS Engineering Steering Group (CESG) is responsible for technical management across CCSDS domains and for the top-level coordination of the overall international standardization process.”**
 - **“A candidate for selection as CESG chair, Area Director, or their deputies must have demonstrated the ability to function independently of his/her own agency’s agenda and to be able to fairly lead the development of international consensus. “**
- **“Providing the CCSDS-wide forum where the work programs of the Areas may be coordinated and synchronized in the context of an overall architecture for space- mission cross support and the needs of individual customers”**

- **“Ensuring that all CCSDS work follows the set of architectural principles agreed to by the CESG and is properly synchronized with work in other areas and with the smooth evolution of the large installed base of CCSDS-compatible mission-support infrastructure”**
- **Identifying “red flag” items where technical work in a proposed CCSDS document is not of the required quality or nature ... or where significant issues exist**
- **Final technical approval before release for agency review or publication**

MOIMS inputs to CCSDS Opening Plenary

CCSDS Meeting Fall 2021

Mario Merri (ESA), Marc Duhaze (CNES)

21/10/2021

• Data Archive Interoperability WG (DAI)

- **MB:** 650.0 Open Archival Information System (OAIS): 5y revision Completed AR, disposing RIDs
- **MB:** 652.0 Audit and Certification of Trustworthy Digital Repositories: 5y revision Under CMC poll for AR
- **MB:** 652.1 Requirements for Bodies Providing Audit and Certification of Trustworthy Digital Repository: 5y revision Under CMC poll for AR
- **MB:** 653.0 Information Preparation to Enable Long Term Use (IPELTU) Under AR, RIDs due 22Nov
- **MB:** 671.0 Open Archive Information Systems Interoperability Framework (OAIS-IF) Architecture Description On-going

• Navigation WG (NAV)

- **GB:** 500.2 Navigation Data Messages Overview: refresh New project approved
- **BB:** 502.0 Orbit Data Message (ODM - NASA, ESA): 5y revision Under AR, RIDs due 14Dec
- **BB:** 503.0 Tracking Data Message (TDM - NASA, ESA): 5y revision Lower priority because of workload
- **BB:** 504.0 Attitude Data Message (ADM - CNES, ESA): 5y revision Almost ready for polls for AR
- **BB:** 505.0 Navigation Data Message XML Specs (NDM - no prototype): 5y revision Published. New project for corrigenda approved
- **BB:** 507.0 Navigation Events Message (NEM – CNES, ESA) Lower priority because of workload
- **BB:** 508.0 Conjunction Data Message (CDM): 5y revision Disposing comments from internal review
- **BB:** 509.0 Pointing Request Message (PRM) Corrigenda published

● **Spacecraft Monitor & Control WG (SM&C)**

- **GB:** 520.0 MO Services Concept (ESA): 5y revision
- **MB:** 520.1 Mission Operations Reference Model (DLR): 5y revision
- **BB:** 522.2 Mission Product Data Distribution Services (ESA, CNES)
- **BB:** 522.x File Management Services (ESA, ?)
- **GB:** 660.1 XTCE Element Description (NASA): 5y revision

Slowed down to reflect MO 2.0
Disposing CESB poll conditions for AR with
the support of the Security WG
Slowed down to reflect MO 2.0
Slowed down to reflect MO 2.0
Published

● **Mission Planning & Scheduling WG (MP&S)**

- **BB:** Mission Planning and Scheduling (ESA, DLR)

Progressing nominally

- **Motion Imagery and Applications WG**

- **November 4th-5th**

- **Specifications for Real-time Protocol as transport for audio & video over DTN**
 - **Review Interoperability Testing status**
 - **Update Yellow Book documentation of testing if no further testing is needed**
 - **Prepare for publication of Blue Book**
- **Review research conducted by DLR on Video Quality Assessment as potential future work for the group**

- **CFDP Revisions WG**

- **Not meeting**

- **VOICE WG**

- **Not meeting**

SIS Meeting Objectives (2 of 2)

- **Delay Tolerant Networking WG**
 - **October 25th**
 - LTPv2 Review
 - Orange Block Discussions
 - Protocol Naming
 - LTP Sec Comments Review
 - **October 29th**
 - ESA Compressed Status Reports
 - BP Custody Discussion
 - **November 2nd**
 - BPv7 Update
 - Current Status Review
 - Formal Naming of Protocol Elements
 - IETF / IANA URI scheme
 - Joint meeting w/ CSS on FRM second week of November
 - **November 3rd**
 - BPsec:
 - Joint Meeting w/ SEA-SEC
 - Operational Concerns / Work-Arounds

- **RF & Modulation WG (E. Vassallo & D. Lee)**

- **401.1-B RF & Modulation:**

- 22 GHz Earth-to-space
 - 26 GHz channel model
 - 26 GHz space-to-space
 - Applicability of 131.2-O (SCCC-X) and 131.1-O (DVB-S2X)

Discussion of draft recommendation

Discussion

Agree on recommendation

Discussion (with C&S WG)

- **211.1-B Proximity-1 Physical Layer:**

- Frequency plan

Discussion on changes (in cooperation with SFCG)

Disposition of Agency Review RIDs

Discussion of new draft recommendation (with SEA-DDOR WG)

- **414.1-B PN Ranging**

- **Wide-band PN DDOR recommendation**

- **RFM Charter and projects**

- **Space Link Code/Sync WG (A. Modenini & K. Andrews)**

- **121.0-B TM Coding:**

- randomizer
 - CADU and CSM terms unification
 - Agency Review RIDs
 - Variable Length Frames

Review in light of new requirements (lunar missions, RA protection, Proximity-1 PL changes)

Discussion

Discussion of proposal

Disposition

Discussion on new project

- **431.1-B VCM Protocol:**

- Technical corrigendum on header and randomizer

Discussion

- **131.2-B Flexible ACM Scheme for HR TM**

- Agency Review RIDs

Disposition

Discussion of technical corrigendum on FHEC

- **732.0-B AOS SDL Protocol**

- **Space Link Protocols WG (G. Kazz & M. Cosby)**

- **121.0-B TM Coding:**

- Variable Length Frames

Discussion on path forward

Discussion about its future

- **130.0-G Overview of Space Communication Protocols**

- **732.0-B AOS SDL Protocol**

- FHEC

Discussion about its removal

SLS Glossary Magenta Book update

Review progress

5-year review

- **Common Terms within SLS Area**

- **Encapsulation Packet and Space Packet GBs**

- **CCSDS 232.1-B COP-1**

- **Space Data Link Security (SDLS) WG (G. Moury & H. Weiss)**

- 355.0-B SDLS pink sheets
- 350.11-G SDLS Extended Procedures
- 350.5-G SDLS Core Protocol
- 911.5-B SLE ROCF and 912.1-B SLE F-CLTU

Agency Review RIDs disposition
Review contributions and produce final draft
Update document to include new standards (USLP, SDLS-EP, ...)
Discussion of SDLS impact

- **Multispectral & Hyperspectral Data Compression (MHDC) WG (M. Wong)**

- 120.2-G Near-Lossless Extension of CCSDS-123.0-B
- 124.0-G Robust Compression of FL HK Data
- 125.0-B Raw SAR Compression

ACHIEVEMENTS: 124.0-B Robust Compression of FL HK Data Blue Book:
(submitted for Agency review);

Review final draft and agree on request for Agency review
Review draft and make writing assignments
Review draft and make writing assignments

- **Optical Communications WG (B. Edwards & C. Heese)**

- Optical Communications C&S for Optical On/Off Keying (O3K)
- CCSDS 141.1-M Atmospheric Characterization and Forecasting for Optical Link Operations
- NASA's Optical Communications Terminal on Orion and the ISS
- NASA's Terabyte Infrared Delivery (TBIRD) project
- Japanese Data Relay Satellite

Finalize recommendations
Agency review RIDs disposition

Receive an update
Receive an update
Receive an update

Spacecraft Onboard Interface Services (SOIS) Opening Plenary

Jonathan Wilmot (Area Director)
Xiongwen He (Deputy Area Director)

Fall 2021 Meetings

- **Activities - Last Six months**
 - Participated in a series of technical reviews of Artemis/Gateway XTCE and SEDS requirements documents
 - Review limited to NASA, US industry, and Artemis partners: ESA, JAXA, CSA
 - Feedback incorporated as part of recent Pink sheet review
 - SEDS pink sheet agency review complete
 - Submitted SOIS/MOIMS orange book for publication
 - Created SEDS DTN operational interfaces and MIB data sheet
 - Coordinated with Cross Support Services (CSS) area on Functional Resource Model/SEDS
- **Upcoming Meeting goals**
 - Finalize 870.1, 876.1, 870.0 with inputs from Pink sheet review and Artemis feedback
 - Discuss SEDS application to configuration data (Tables, files, memory loads,...)
 - Discuss SEDS tooling needs (Use cases)
 - Artemis Mission Control Center (MCC) looking for editing and display tools
 - Develop green book material on relationship of component SEDS and deployment SEDS
 - Present DTN SEDS to SIS-DTN WG during fall meeting, work DTN Network Management group
 - DTN BP encoding in SEDS has highlighted issues in the IETF DTN standard
 - Coordinate with Cross Support Services (CSS) area and SEA on Functional Resource Model/SEDS mapping of operational interfaces and MIBs
 - Access resources and discuss WG future plans

- **Activities - Last Six months**
 - Minimal
 - Staff supporting higher priority flight projects
 - 5-year reviews are late
- **Upcoming Meeting goals**
 - Develop plan to address staffing issues
 - Discuss book priorities
 - Analysis of upcoming mission needs highlight a disconnect between useability/applicability of some existing books and future mission requirements
 - Significant mission use case for updating Synchronization Service book (in 5-year review).
 - Coordinate with SEA-Time

SOIS-Wireless Area Fall Meeting

- **Activities - Last Six months**
 - Processed Agency RIDs for CCSDS 883.0-R-1,
 - Processed CESG poll conditions for CCSDS 883.0-R-1 publication
 - Began on 3GPP band survey for lunar surface spectrum trade study (via NASA 3GPP WG)
 - Conducted bi-weekly WG tagups
 - Document editing
 - Interoperability testing progress review
 - Stakeholder coordination (e.g., Nokia lunar LTE demonstration team, NASA spectrum)
- **Meeting Objectives**
 - Finalize resolution of CESG poll conditions for 883.0-R-1
 - Primarily DTN adaptation profile diagram details
 - Begin composition of follow-on pink sheets to add roaming scenarios
 - Plan post-pink sheet SOIS-WIR activities with international partners (primarily CSA)
 - Continue 3GPP band survey for lunar surface spectrum trade study

Cross Support Transfer Services WG

Monitored Data Service (BB-2)
Tracking Data Service (BB-2)
All SLE Books
Functional Resource Model (MB)

Functional Resource Model (SANA+)
SANA Functional Resource Registry (Tier 1)

Convince the AD to submit for AR polling
Convince the AD to submit for AR polling
Revise and re-submit for AR polling
Assess readiness for agency review; plan for book captain succession
Review Tier 2 resource definitions
Approve publication of registry

Cross Support Service Management WG

Service Management Concept (GB)
Communications Planning Information Format (BB)
Terrestrial Generic File Transfer (BB)
Service Management Utilization Request Format (BB)
Service Package Data Format (BB)
Event Sequence

Configuration Profile, Service Agreement

Survey for refresh
Review prototype report; release for publication polling
CESG publication poll condition resolution
Convince the AD to submit for agency review
Convince the AD to submit for agency review
Review examples from consistent with current draft outline/direction
Review auto schema (from FRM) generation progress; discuss service agreement content

CSS (Area Level)

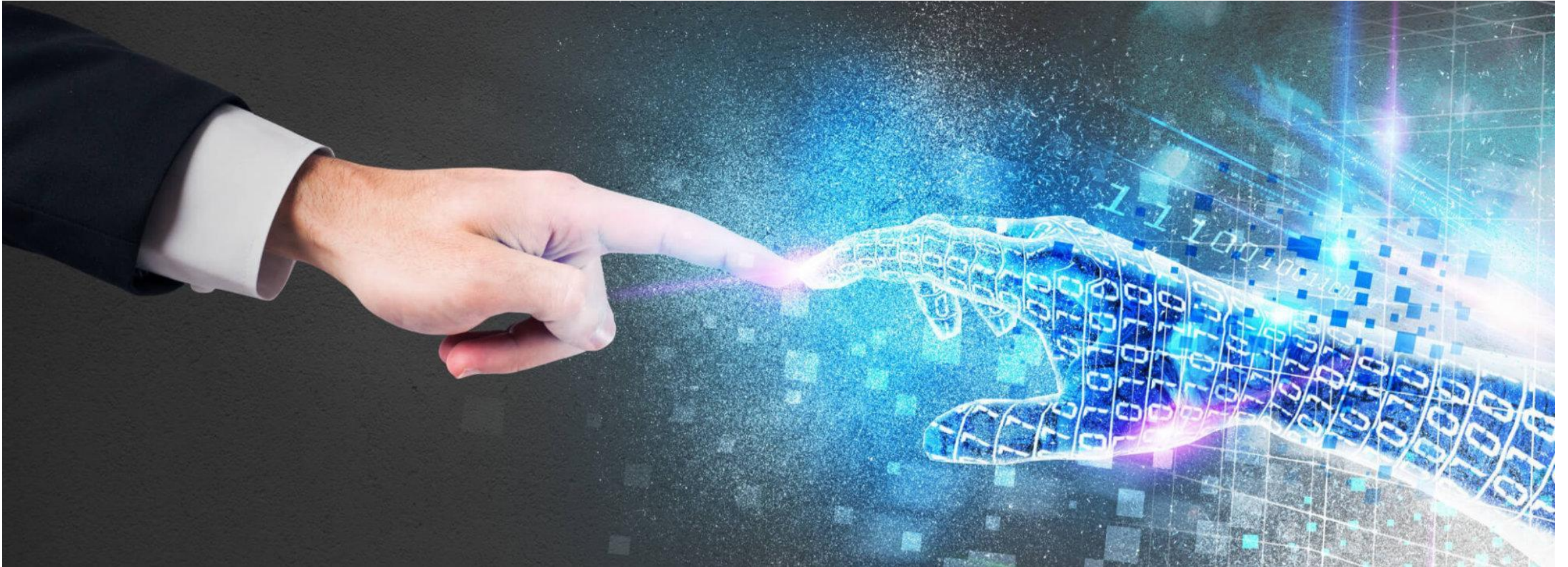
CSTS & CSSM

CSS + SIS DTN WG

Discuss, coordinate: re
o FRM classification metadata
o FRM & use of Eclipse modeling framework (EMOF)
o CSS Area standards & cloud computing
o Use of GitHub
Overview of FRM and discussion – this is a follow up to discussion with SOIS Area earlier this year

Fall 2021 Virtual CCSDS Meetings

SEA Plenary – Workplan



SEA Meeting Objectives: 1/1

- **Security WG (Chair: Howie Weiss)**
 - Key Management (GB, MB) MB sent to CESG for approval to publish, application being worked in SDLS, GB in work
 - Threat GB GB sent to CESG for approval to publish
 - Algorithm GB Updates In work
 - Intergovernmental Certificate Authority MB In development
 - Bundle Protocol Security (BPsec) Joint with DTN WG, agree to base on IETF
 - *Standard security section* *Mandatory*
- **Delta-DOR WG (Chair: Javier de Vicente)**
 - Delta-DOR Architectural Guidelines (MB) MB in process
 - Delta-DOR Raw Data Exchange update (BB) BB in progress
 - Delta-DOR Operations update (MB) MB in progress
- **System Architecture WG (Chair: Peter Shames)**
 - RASDS MB Extensions Updates in development, joint with TC20 / SC 14
 - SCCS Architecture Reqmts MB Updates for new standards, in development
 - CCSDS Ontology Glossary issues noted, TC20/SC14 meetings held
- **Time Exchange / Sync Standards WG (Chair: Jon Hamkins)**
 - Time Management GB GB in progress, expected soon
 - Time Management BB & MB In planning, waiting on GB completion
- **SANA Steering Group (SSG) (Chair: Peter Shames)**
 - SANA Steering Group (SSG) Active, meeting this month
 - CCSDS Registry interfaces Working on improving access & controls for SANA Registries
 - *Standard SANA section* *Mandatory*

CCSDS Code of Conduct

Work for the net benefit of the international community	We recognize that the development of International Standards is for the net benefit of the international community, over and above the interests of any individual or organization. We are committed to advancing International Standards within their agreed scope and we will not hinder their development.
Uphold consensus and governance	We will uphold the key principles of International Standardization: consensus, transparency, openness, impartiality, effectiveness, relevance, coherence and the development dimension.
Agree to a clear purpose and scope	We are committed to having a clear purpose, scope, objectives, and plan to ensure the timely development of International Standards.
Participate actively and manage effective representation	We agree to actively participate in standards development projects. We will make our contributions to the work through the official procedures in accordance with the ISO/IEC Directives.
Escalate and resolve disputes	We will identify and escalate disputes in a timely manner to ensure rapid resolution. We will uphold the agreed dispute resolution processes.
Behave ethically	We will act in good faith and with due care and diligence. We will avoid collusive or anticompetitive behaviour. We will promote a culture of fair and ethical behaviour.
Respect others in meetings	We are committed to respecting others and the professional culture of international standardization within ISO. In meetings we are committed to: <ul style="list-style-type: none"> • conducting ourselves in a professional manner • respecting others and their opinions • accepting group decisions • ensuring that the views of all (including those whose first language is not that of the meeting) are heard and understood

Further, CCSDS adopted the following items to augment the ISO Code of Conduct:

Respect Intellectual Property	We will not plagiarize the work of other working group colleagues that is revealed during the standards development process. We will notify our colleagues of our intent to publish and provide them with a courtesy summary of the content before proceeding with any publication related to our standardization work.
Confidentiality of pre-decisional technical discussions	We will keep internal group discussions/tradeoffs/disputes in confidence, and will not publish such tradeoffs in public fora until agreed to by the technical working group community. When such matters are publicly represented, the individual positions of our technical staff will not be personally identifiable without their permission.

CCSDS Spring 2022 Meeting

- The Spring 2022 CCSDS meetings will be hosted by Marshall Space Flight Center in Huntsville, AL.
 - Technical Meetings: 9-13 May 2022
 - CESG Meeting: 16 May 2022
- The venue for the meetings is the Westin Hotel at Bridge Street Town Center:
<https://www.marriott.com/hotels/travel/hsvwi-the-westin-huntsville>
- Bridge Street Town Center offers multiple options for dining and shopping and is a centrally located in Huntsville.



Westin Huntsville Photos



Future Meetings

Date	WG/CMC	Host	Location	Date	Comments
Spring 2022	WG/CESG	NASA	Huntsville, Alabama, USA	9-16 May 2022	← 5-Day
	CMC/SC13	JAXA	Tokyo, Japan	TBD	
Fall 2022	WG/CESG	CNES	Toulouse, France	TBD Date	← 5-Day
	CMC/SC13	CNES	Toulouse, France	TBD Date	
Spring 2023	WG/CESG	NASA	TBD Sao Jose dos Campos, Brazil	TBD Date	
	CMC/SC13	INPE		TBD Date	
Fall 2023	WG/CESG	ESA	TBD, hosted by ESTEC	TBD Date	
	CMC/SC13	ESA	TBD	TBD Date	
Spring 2024	WG/CESG	NASA	USA	TBD Date	
	CMC/SC13	ROSCOSMOS	TBD	TBD Date	
Fall 2024	WG/CESG	UKSA	TBD	TBD Date	
	CMC/SC13	UKSA	TBD	TBD Date	

Acknowledgements

The Secretariat wishes to thank NASA Marshall Space Flight Center for providing the information on the location of the Spring 2022 CCSDS Meetings.

Working Group Agendas and Additional Resources

All information about the CCSDS Spring 2021 Meetings can be found on the CCSDS Public Website page: <https://public.ccsds.org/meetings/2021Fall/default.aspx>.

Individual Working Group Agendas may be found on the CCSDS Public Website at: <https://public.ccsds.org/meetings/2021Fall/2021FallAgendas.aspx>.

A schedule of individual meeting sessions is available on the public website in two versions. As a [List](#) or a [Table](#).

To find contact information for each Area Director and Working Group Chair and request a meeting invitation visit the CWE at: <https://cwe.ccsds.org/default.aspx>.

If you have any questions about the meetings or require any other assistance, please let us know at secretariat@mailman.ccsds.org.