Report from the CGMS WGI Task Group on Low Latency Data Access

Presented to CGMS-53 Working Group I session, agenda item 2.1

Coordination Group for Meteorological Satellites

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Executive summary of the WP

The Low Latency Data Access Task Group was formed from the merger of the former Direct Broadcast Task Group and the Coordination of LEO Orbits Task Group.

The LLDA Task Group provides a forum for CGMS agencies to address improving LEO satellite systems low latency data access from both a global and regional perspective, harnessing common emerging technologies and taking account of the evolution of the commercial and agency space systems. It is foreseen that historical boundaries between global and regional mission requirements and architectures may be substantially eliminated.

The Terms of Reference presented at CGMS-52 remains valid.

The document “Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of Low Latency Data Access from LEO Meteorological Satellites” [CGMS-52-EUMETSAT-WP-13] presented at CGMS-52 requires further analysis through subject matter experts in order to propose priority areas and concrete steps for demonstrations. Members are encouraged to bring back proposals to the TG (WGI/A52.02 remains OPEN).

Further analysis of the draft Global LLDA Best Practices revealed further maturation is needed and the way forward on Action WGI/A51.09 is presented separately.

Compliance with the best practices are covered by the agency's individual reports.

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Open Actions for LLDA TG

LLDA TG	5.5	WGI/A51.09	Merge the LEO (Global) and DB (regional) best practices into a single "Low Latency Best Practices" document proposed to be structured as follow: · Common BPs for both regional and global missions · BPs specific for DB · BPs specific for global mission Present the merged BPs for endorsement to CGMS-52.	**2025 Feb 11: Keep global and regional separate, and keep global in draft.** **See separate presentation for action recommendations.**	CGMS-52	**OPEN**	2.3.3
LLDA TG	5.6	WGI/A52.02	Identify concrete CGMS actions based on the LLDA SWOT, including priority areas and demonstration cases in agencies. E.g. cloud, TT&C, relation with private sector, etc.	***2025 Feb 11:*** **Input was requested from all the TG members during the intersessional meetings to try stimulate inputs ahead of the WGI. Discussion can take place in CGMS 53 and then followed up during the LLDA intersessional sessions.**	CGMS-53	**OPEN**	

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LLDA TG Membership as of Feb 2024

LLDA current list of members:

CMA
Siwei Tian
Shuze Jia
Chengli Qi
Lei Yang

EUMETSAT
Andrew Monham (TG co-chair)
Nicholas Coyne (TG co-chair)
Pier Luigi Righetti
Jose Maria de De Juana Gamo
Karolina Nikolova
Sean Burns
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Bruce Thomas
Changyong Cao
~~Fred Mistichelli~~
James Donnellon
Jordan Gerth
Chris Sisko
Mark Turner
Melissa Garcia
Nancy Ritchey
Otto W. Bruegman
William Skip Dronen
Satya Kalluri
Toby Hutchings

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Terms of Reference – Low Latency Data Access Task Group from LEO satellites

1. To provide a forum for CGMS agencies to address improving LEO satellite systems low latency data access from both a global and regional perspective, harnessing common emerging technologies and taking account of the evolution of the commercial and agency space systems. It is foreseen that historical boundaries between global and regional mission requirements and architectures may be substantially eliminated. This shall include analysis of:
   a) Novel methods to achieve global data coverage and access
   b) Temporal coverage over a given geographic area
   c) Low latency data delivery
   d) Reducing pass scheduling conflicts
   e) Maximising the amount of instrument observation collected
   f) Reducing risk of radio frequency interference
   g) Fixed temporal separation between instrument observation
   h) Reduced risk of satellite proximity

2. To address technical and operational aspects of direct broadcast services (present and future) of mutual or global interest for the CGMS agencies

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Terms of References – Low Latency Data Access Task Group from LEO satellites

3. To promote standards and interoperability and operational procedures to the CGMS agencies for the benefit of the user community of their direct broadcast services and the associated regional retransmission services

4. To explore impact of space-based data relay systems
   Specific studies may be actioned by WGI to the LLDA TG to assess impact of new technologies on enabling innovative solutions to achieve low latency data access from LEO weather satellites

5. The LLDA task group report to CGMS WGI

6. The LLDA task group will nominate a chair. It will meet at least once a year, and more if necessary, and will pursue its work by correspondence between its meetings

Current LLDA TG co-chairs are Andrew Monham and Antoine Jeanjean ***(Nicholas Coyne has been standing in for Antoine from November 2024 and expected to hand back to Antoine June 2025).*** *The TG will meet at least 3 times per year. The TG has a specific mailing list: L-WGI_LLDA@LISTSERV.EUMETSAT.INT*

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7. The LLDA yearly documents deliverables consist of:

- Item 1: Report from the CGMS WGI Task Group on Low Latency Data Access from LEO satellites (EUMETSAT)
- Item 2: Operational systems status report of LEO satellites + status of implementation of best practices (CMA)
- Item 3: Operational systems status report of LEO satellites + status of implementation of best practices (EUMETSAT)
- Item 4: Operational systems status report of LEO satellites + status of implementation of best practices (NOAA)
- Item 5: Best Practices for Low Latency Data Access from LEO Satellites - latest version and new proposals (NOAA)
  - Note that Item 5 is replaced this year by the presentation “Proposed way forward for LEO Direct Broadcast and coordination of LEO orbits Best Practices (EUMETSAT)”

SWOT Analysis: Priority Areas and Demonstration Proposals

Action WGI A52.02: Identify concrete CGMS actions based on the LLDA SWOT, including priority areas and demonstration cases in agencies. E.g. cloud, TT&C, relation with private sector, etc.

The TG proposes that further analysis be performed in consultation with subject matter experts.

TG members are encouraged to engage with the technical /programmatic teams in their respective organisations to report on:

- Identified priorities
- Planned demonstrations of new technologies and operations paradigms
- Expected outcomes in terms of improved low latency data delivery

The TG will then compare and contrast the approaches, assess scope for coordination and report on the expected user value from these plans.

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Key issues of relevance to CGMS:

- The Low latency Data Acquisition Task Group includes in scope the considerations under HLPP 2.9: New technologies for satellite systems

To be considered by CGMS:

- WGI is invited to :
  - Consider the proposed approach to ensuring progress on Action A52.02 relating to the SWOT Analysis of Low Latency Data Access from LEO Meteorological Satellites *(CGMS-52-EUMETSAT-WP-13)*
  - Take note of separate presentation on the proposal not to merge the regional and global BP documents and action recommendations made there