Technical Sub-Group on
Direct Broadcast Packages & RARS
Report on RARS

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Participants

- Liam Gumley & Jérôme Lafeuille (Co-chairs)
- Nathalie Selbach
- Nigel Atkinson
- Anna Booton
- Kathy Strabala
- Graeme Martin
- Rebecca Cintineo
- Pascale Roquet
- Katerina Melnik
- Geoff Cureton
- Ashim Kumar Mitra
- Scott Mindock
- Su-Hyun Jung
- Jeong-Sik Kim
- Jae-Dong Jang
- Dieter Klaes
- Kelvin Brentzel
- Akira Okagaki
- Mitch Goldberg
Topics discussed

• RARS status (ATOVS data)

• RARS evolution (hyperspectral sounder data)
  – Data coding
  – GTS dissemination

• Convergence between RARS and NOAA DBRTN

• Keeping the RARS initiative on track
  – RARS Implementation Group
RARS Network Status

- RARS currently provides retransmission of ATOVS L1c, from 42 stations covering 80% of the globe, within 30 min

- 3 components:
  - EARS (18 stations)
  - Asia-Pacific (16 stations)
  - Brazil/Argentina (8 stations)
What is RARS?

• A network of Direct Readout stations sharing their data in near real time …

• … following a set of procedures and best practices to ensure interoperability, global availability and timeliness of RARS products

• Key requirements:
  – Use current AAPP and deliver L1c in BUFR
  – Send over the GTS (and possibly other means) within 30 min
  – Identifiers, Bulletin headings and WMO filename convention
    • New codes and headings defined for IASI, CrIS, ATMS
Convergence between RARS and DBRTN (1)

- NOAA/DBRTN and WMO/RARS are willing to share their data
- DBRTN data would be sent to GTS via EUMETSAT and DWD

- Issue 1: Check NCEP-RARS compatibility of BUFR formats
  Action: NOAA to review what is needed in BUFR format for CrIS, ATMS and IASI and determine if they could use AAPP BUFR (i.e. RARS format) instead of NCEP BUFR *(Mitch Goldberg)*
  Action: NOAA to send samples of NCEP BUFR data to Nigel Atkinson *(Liam Gumley)*

- Issue 2: Acceptable data rates for the GTS
  Action: WMO will inform the group on the data rates supported by the various links of the GTS *(Jérôme Lafeuille)*
Melbourne has implemented backup links over the Internet to Tokyo, Washington and Exeter

Regional Meteorological Telecommunication Network for Region V (South-West Pacific)

10-FEB-2010
Figure 1: Regional Meteorological Telecommunication Network for WMO Region VI

Transmission speed in kilobit/s

1G/100M, 512/128, 9.6, 64, 0.05, 2.4, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/128, 50M/50M, 20M/20M, 10M/10M, 2M/2M, 1M/1M, 8M/8M, 4M/4M, 100M/10M, 7M/7M, 1M/1M, 1G/200M, 1M/1M, 21.6, 10M/10M, 128/13.03.2014
Convergence between RARS and DBRTN (2)

- Issue 3: Ensure interoperability of RARS and DBRTN
  - Action: SSEC, NOAA, EUMETSAT, WMO should coordinate on data formats, software versions, and latency requirements and come up with a plan to provide the DBRTN products for inclusion in RARS.
Draft WMO Guide on (D)RARS

- Direct Readout And Re-distribution System for LEO satellite data
- Addressing standard/recommended practices for (D)RARS operators and users including:
  - Processing software
  - Product format
  - Product distribution
  - Service requirements (availability, timeliness, quality control)
  - User information
  - Maintenance and Operations
  - Procedure for station inclusion/removal
Convergence between RARS and DBRTN (3)

- Action: The draft Guide to RARS which defines the RARS procedures, software, formats, data exchange convention, service requirements, etc. should be finalized, published, and shared widely with potential data providers (Jérôme Lafeuille)
Keeping RARS on track: governance

- RARS matters are addressed at ITSC, at CGMS-WGI, and at NAEDEX-APSDEU
- Transition to advanced sounders and convergence with DBRTN require special attention

➢ Action: There is a need for reactivating the RARS Implementation Group within WMO with a broader scope to include NOAA DBRTN (Jérôme Lafeuille)
Thank You
for your support
to the (D)RARS!
More background
Progress on RARS since ITSC-18

• Additional stations providing NOAA/ATOVS RARS products
  – New-Delhi, Chennai (IMD) in test mode
  – Tahiti (Meteo-France) to become operational within a few days
  – Easter Island planned through agreement between CLS-Argos and Chile
• A number of stations (24 out of 42) providing METOP/ATOVS
• Hyperspectral IR sounder products
  – EUMETSAT provides IASI and CrIS products on a pilot basis
  – Codes and identifiers proposed for these new products
  – Estimation of data rates (requested by APSDEU/NAEDEX)
• CGMS-41 was informed on the NOAA project of Real-Time Network for Low-Latency Infrared and Microwave Sounder Data
  – Recommended convergence with RARS
Resources on RARS

- WMO Space Programme ([www.wmo.int/sat](http://www.wmo.int/sat))
  => Data access and use => RARS
  (or Google: WMO+RARS)
  - RARS network and status
  - RARS Coding Summary
  - RARS Operators Standards
About RARS coding issues

- **Contents of RARS Coding Summary**
  - Station coordinates
  - BUFR description section elements: (Sub)centre ID, data (sub)category
  - GTS Headings $T_1T_2A_1A_2\text{ii} CCCC YYGGgg (BBB)$
  - Filename elements
  - With examples and links to relevant WMO Manuals and Code Tables

- **BUFR Data sub-category for new instruments**
  - Hyperspectral IR= 30, Microwave sounder=40

- **GTS Heading: New (draft) entries for $A_1$**
  - IASI=Q, CrIS=C, ATMS=S

- **Recommended registration in « Vol. C1 »**