

EUMETCAST TERRESTRIAL SERVICE- User Case

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1. Introduction

1. Preparation for MTG > 5 years.
2. Facts shared on MTG:
 1. RAIDEG –Objectives
 2. Two directional pathway to receive MTG data.
 - EUMETCast-Satellite vs. EUMETCast-Terrestrial
 - EUMETSAT recommendation – EUMETCast Terrestrial - if you want to receive the full spectrum of MTG products.

2. Roadmap to Terrestrial Service (1)

EUMETCast Satellite service –Baseline service @ SAWS.

- a. Served SAWS well since 2006 (Operations, Research and Training)
- b. SAWS (used an in-house developed processing and display system –SUMO).
- c. Very economical –deployment across the country:
 - i – SAWS multiple sites (7) weather offices
 - ii – 3x Public institutions
 - iii – 1x Academic institution
 - iv – More users followed later (Working on fire etc)

2. Roadmap to Terrestrial service (2)

- Of the multiple sites only 2 were in operation in 2023:
 - HQ/Irene
 - Aviation Centre at OR Tambo International Airport.
- Reasons & Challenges:
 - EUMETSAT movement satellites requiring re-alignment which in many cases (outstations) were not successful.
 - Interference from 5G mobile services.
 - **SAWS-Office relocation:** Interference also experienced at HQ and OR Tambo International Airport (backup station) resulting in very haphazard service.

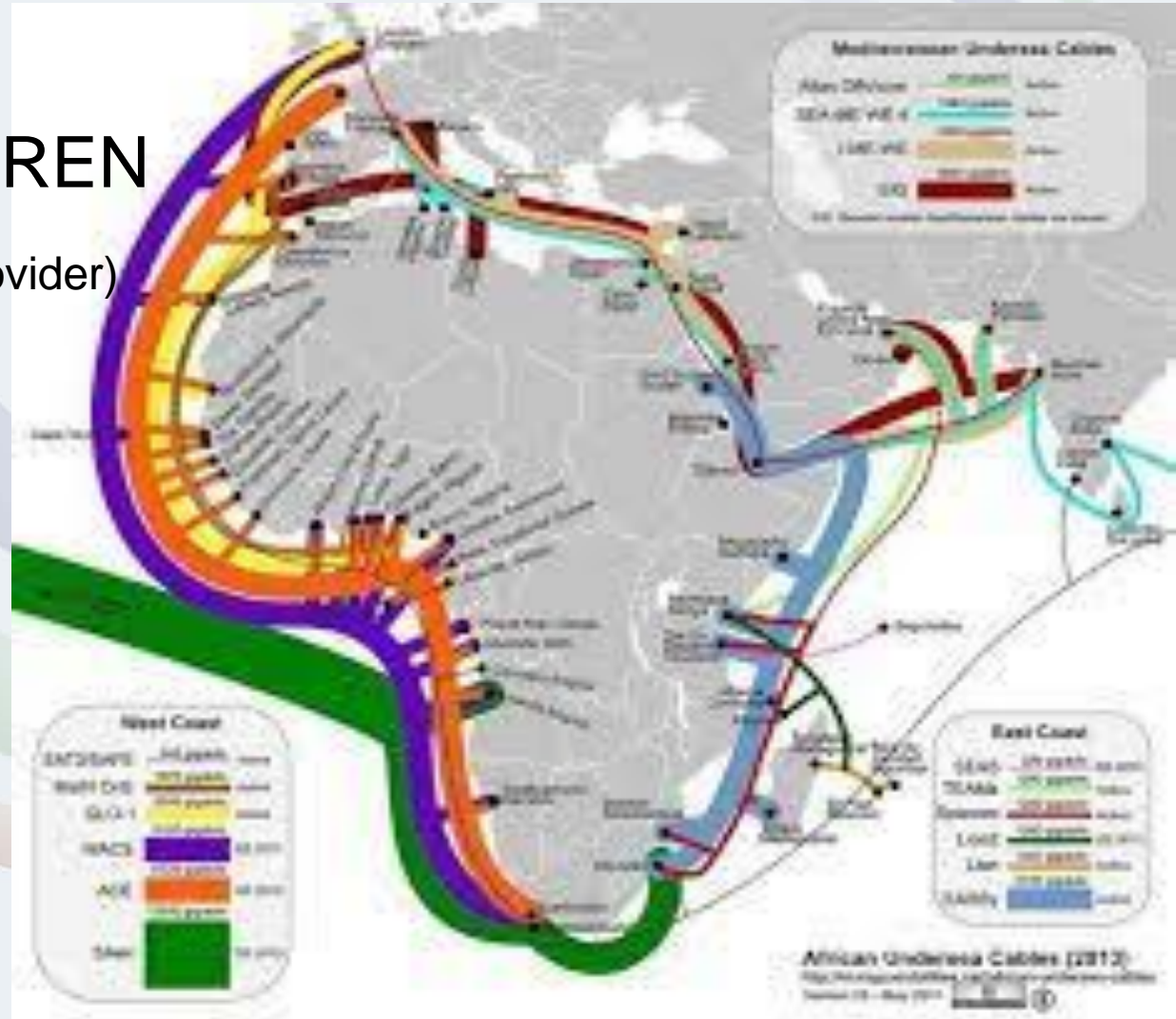
Note:

SAWS as SADC RSMC: Running the NWC-SAF products and disseminating on the RSMC Web Portal require **100% data availability**



NREN-Africa (Optical Fibre Connections)

- South Africa- SANREN
- TENET (SA-Service Provider)



3. Activities to implement the Terrestrial Service.

Solution: Implement the EUMETCast Terrestrial service since SAWS was linked to the NREN.

EUMETCast-Terrestrial Service: The service SAWS earmarked to initiate with the commissioning of MTG.

Other Options to Access EUMETSAT Information:

1. EUMETView
2. EUMETSAT Data Store
3. Cloud-based Solution (European Weather Cloud)

4. Implementation activities: Terrestrial service

Terrestrial service was implemented on SAWS environment but initially a **10% packet loss** was experienced during the testing phase.

Efforts to reduce the packet loss:

1. The TelliCast software implemented which can be adjusted by (NAK & ACK) recovery mechanisms to recover lost packets.
2. Dedicated Network card on SAWS virtual infrastructure for **Virtual Terrestrial Server** was provided.
3. **SAWS Institutional Firewall** rule was amended (relaxed) to limit any filtering or scanning of packets.
4. NREN engagement to apply shortest path to source (“bottleneck” was discovered through UK)



In collaboration with EUMETSAT, SAWS managed to reduce the packet loss to below 1%.

5. Way Forward for SAWS

1. Current situation:

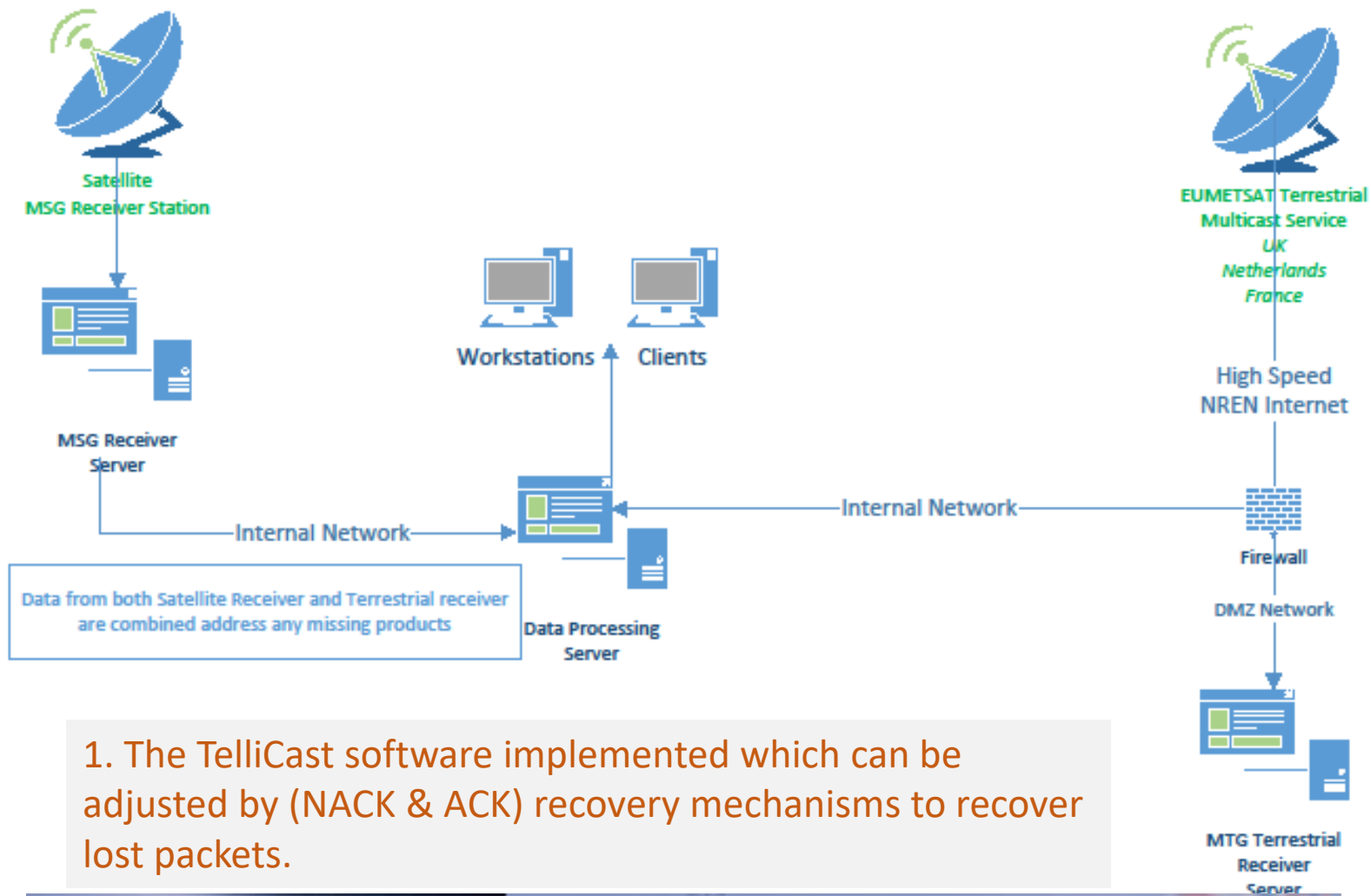
Hybrid System : Terrestrial & Satellite system working in tandem eliminating data packet loss (100% availability).

2. Further Options to explore:

2.1 Physical server currently in testing to eliminate any Virtual Platform congestion

2.2 Further Firewall testing with (NAK & ACK) recovery mechanisms.

2.3 NARC-Setting to be activated.



1. The TelliCast software implemented which can be adjusted by (NACK & ACK) recovery mechanisms to recover lost packets.

EUMETSAT TELLICAST Multicast Distribution System Client
 Status: OK

6. Conclusion

1. Lessons to be learned for African NMS's

- 1.1 Terrestrial service implementation – it is not necessarily “plug and play”
- 1.2 Each terrestrial installation is “unique” – be treated on its own merit.
- 1.3 Each NMS has its own architectural design of its communication network and link to NREN.
- 1.4 Advance knowledge and involvement of different role-players necessary.
 - a. Local NMS - ICT Network architecture
 - b. EUMETSAT-Helpdesk & Assistance
 - c. Local NREN Operators (Relationship)

END

Acknowledgement:

The support provided by the EUMETSAT Helpdesk and specifically the efforts of Erdem Erdi in assisting SAWS.

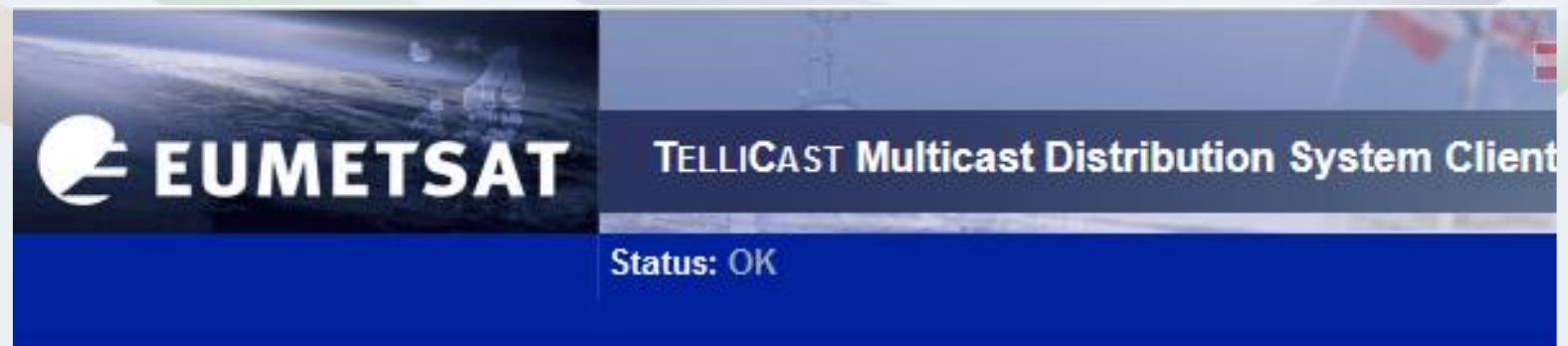


Terminology:

DMZ = Demilitarised Zone. It is the area on the Firewall (Secure network area “sandwiched” between the external network and the internal network)

ACK or NACK - (NACK signal is sent to notify the sender of the discrepancy – **Negative Acknowledgement**).

ACK – (confirms the successful reception of data - **positive acknowledgment**).



Weather Service