Infrastructure Committee, Data Centers and RINEX

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IGS INTERNATIONAL GNSS SERVICE

2022 Virtual Workshop
"Science from Earth to Space"

Session **Information**

Rapporteur: Markus Bradke

Participants: 130

Discussion **Highlights**

- An online poll asked participants to answer a series of questions on the future direction of the IGS infrastructure. 80% of attendees participated and contributed 3348 responses.

- Climate change, hazard monitoring and emergence of telecommunication standards were identified as key societal and scientific drivers that will impact on the future direction of the IGS infrastructure.

- There was very strong agreement that the existing network needs to expand to better support the generation of IGS products and community needs.

- There was strong desire to implement modern ways of accessing the IGS data (ie. APIs) and investigate a more cloud native approach to data storage.

- There was support to investigate a higher tier of data centre (global archive) with some form of service level agreement with the IGS.

Key Issues

- There is no set of minimum requirements that a global data centre needs to comply with (accept file uploads, file checks, etc.)

- Information Security is underestimated and needs to be continuously addressed (e.g., use of unencrypted protocols)

- Improvement on a fully multi-GNSS network is needed since only 150 of the 512 stations track all signals (e.g., dual-frequency BDS-3)

Major **Accomplishments**

- Weekly positions for all IGS network station (included in GFZ finals)
- Create 1 daily tar file for the high-rate data (CDDIS only)
- Created DC Coordinator position
- Moved to gzip compression for IGS data (products outstanding)
- Integrate MGEX campaign directories into main GNSS directory structures prior to 2016
- Integration of MGEX data (products outstanding) into the regular GNSS directory structure

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Changes to Charter/Goals and Objectives

- Role of the Infrastructure Committee chair changed to a coordinator role
- Data Center Coordinator role got implemented

Recommendations (1/3)

- Following input from the community at the 2022 workshop, develop a roadmap to enhance the IGS tracking network to meet the shifting user needs.

  Network diversity, Outreach and Engagement, Capacity building

  [2021+ direct alignment - 1.1, 1.2, 1.3, 2.1, 2.4, 3.1, 3.2]

  (6-12 months)

- Advocate for the importance of information security across the IGS to improve the resilience of the infrastructure and increase trust and confidence in our data and products.

  Basic risk assessment and questionnaire on security, Case studies

  [2021+ direct alignment - 3.1, 3.2]

  (6-12 months develop plan and continuous review, security risks don't go away)

Recommendations (2/3)

- Explore modern standards, data storage and access methodologies to improve the FAIRness of the IGS data and metadata.

  Cloud-based storage formats, APIs, Implementing GeodesyML across networks

  [2021+ direct alignment - 2.4, 3.4]

  (6-24 months)

- Develop a proposal to investigate a higher tier of data center (global archive) which would set mandatory requirements such as quality control, data synchronization and some form of service level agreement with the IGS.

  [2021+ direct alignment - 3.1, 3.2, 3.4]

  (12-24 months)

Recommendations (3/3)

- Actively engage with all working groups to support them in accessing the data and products needed to succeed in their objectives.
  (continuous)

TBD: Dedicated action items with priorities for each work package and continuous tracking of progress

Major purpose in the IGS and in the greater geodesy community

To coordinate, sustain and enhance the global IGS infrastructure to ensure the community has secure and easy access to the highest quality multi-GNSS observation data and accurate station metadata.

Possible Impediments

- The voluntary nature of the IGS infrastructure presents a risk to the continuous availability of the data
- Limited resources
- Getting the community to support realizing its recommendations

What the public should know about the IGS

"If you search for independent data and products all around the globe for all four global GNSS systems, the IGS is definitely the right place - so do support our activities."

"That the public was more aware of the huge effort that goes into providing the high quality IGS data and products and that the IGS wouldn't exist without their volunteer member organizations."