IGS Data Center Working Group 2015

C. Noll

NASA Goddard Space Flight Center, Code 690.1
Greenbelt, MD 20771 USA
Carey.Noll@nasa.gov

1 Introduction

The IGS Data Center Working Group (DCWG) was established in 2002. The DCWG tackles many of the problems facing the IGS data centers as well as develops new ideas to aid users both internal and external to the IGS. The direction of the IGS has changed since its start in 1992 and many new working groups, projects, data sets, and products have been created and incorporated into the service since that time. The DCWG was formed to revisit the requirements of data centers within the IGS and to address issues relevant to effective operation of all IGS data centers, operational, regional, and global.

2 Recent Activities

2.1 RINEX V3 Integration

The DCWG continues to work with the IGS Infrastructure Committee (IC) on various topics of mutual interest. One primary area is the support of GNSS data in RINEX V3 format, initially utilized in the data holdings of the Multi-GNSS Experiment (MGEX) but becoming increasingly important in IGS activities in general. The following recommendations were generated from the June 2015 DCWG meeting, held during the 2014 IGS Workshop in Pasadena, CA:

1. Develop a transition plan that will integrate RINEX V3, including the V3 filename convention, into the operational IGS archives by the end of 2015. (IC, DCs, ACs, MGEX WG)

   Progress: This recommendation supports the IC goal of "one network one archive." The current parallel "campaign" structure found at the DCs supporting MGEX limits the motivation of the ACs to switch to the RINEX V3 format. Integration of the two data archives (operational and campaign) will promote use of multi-GNSS data and the new format. Thus, the MGEX Working Group recommended the development of a transition plan that outlined the steps necessary for integrating the MGEX/RINEX V3 data into the operational archives. During 2015, the IC developed and circulated the draft plan, which was approved at the IGS Governing Board meeting in December 2015.

   The way forward on this task was to have stations/operations centers utilize the file naming convention outlined in the RINEX V3 format documentation for any data in RINEX V3 format supplied to the IGS. Messages were sent to the IGS Analysis Centers (AC) and the user community in general, presenting the steps outlined in the transition plan, and informing users of the impending updates to the data center structure. A few GDCs, the CDDIS and IGN, began implementation of the recommendations in the plan in late December 2015 by agreeing to include any RINEX V3 data (starting with 2016 data) supplied with the V3 file naming convention in the operational archives. Thus, both RINEX V2 and V3 data can be found in the main GNSS data directories at these data centers. The campaign directories, e.g., for MGEX, continue to contain data in RINEX V3 format utilizing the older, 8.3 filename format.

2. Provide software tools that DCs can use to continue to provide needed QC and metadata extraction enabling creation of data status information.

Progress: During the past year, a candidate tool for the DCs that can provide QC and generate reports from data in RINEX V3 format was suggested. The IC has had some success with G-Nut/Anubis, a command line tool developed by the Geodetic Obsevatory Pecny (GOP) for multi-GNSS data in RINEX V3 format. Tests are underway at DCs with the Anubis software.

3. Provide software tools to support data conversion (e.g., RINEX V3 to RINEX V2; RINEX V3 filename creation) that both DCs and ACs can use.

   Progress: In order to provide more data in RINEX V3 format in the main/non-campaign directories at the GDCs, the IC has requested that the DCs create files using the RINEX V3 file naming convention from multi-GNSS data in the old filename format. The IC has had success with the gfzrnx tool, developed at GFZ; DCs are testing the software for this function.

2.2 Site Metadata Activities

Another area of interest for the IGS IC and DCWG involves metadata, particularly in the area of site logs. The IGS CB uses the Site Log Manager System for handling IGS site logs, which provides a basis for promoting the transmission of these logs in XML format. An XML/database management approach to site logs provides several advantages, such as rapid update of site log contents, utilization of consistent information across data centers, and availability of more accurate station metadata. The IGS CB and UNAVCO, in conjunction with the DCWG, held email discussions and telecons to allow participants in this effort to collaborate and plan for the way forward in design, development, and implementation of a shared geodesy XML schema, possibly utilizing the site log schema developed at SOPAC, for site information. During 2015, F. Boler continued coordination of this activity under the auspices of the IGS DCWG. Several telecons were held with various IGS data center, network, and infrastructure contacts; the collaborators have identified GeodesyML, an application schema of the Open Geospatial Consortium, for encoding the Site Log XML metadata elements.

DCWG members participated in a GGOS-sponsored technical interchange meeting on metadata in August 2015, hosted by UNAVCO, in order to develop a space geodesy metadata standard that can be used by the services and GGOS. The Site Log XML effort was a topic for discussion and attendees agreed that this effort within the IGS will prove useful to, and could be adopted and modified by, the other services.

2.3 Other Activities

DCWG members worked with contacts at the new GDC in Wuhan to begin their integration into the flow of IGS data and products. The chair also worked with ACs and coordinators on submission of repro2 products for their contributions to ITRF2014. Transmission of data from the NGA GPS monitoring sites resumed in 2015 and GDCs were notified of their availability for their archives.

3 Future Plans

The DCWG will continue to coordinate with the IC and MGEX activity to fully realize the integration of data in RINEX V3 format into the main, operational archives at the IGS GDCs. The integration of these files with “long”/RINEX V3 filenames into the operational archives is progressing for data in 2016. Data centers will continue to test software for creating files using this V3 filename format to support the integration task. Once these procedures are reviewed by the IC and tested, DCs will provide files following the V3 naming convention in the operational archives for MGEX data prior to 2016. Work on the site metadata activity will also continue. Additional topics the WG hopes to address follow.

- Support of the IGS Infrastructure Committee: A major focus of the DCWG will be to support the IC in its various activities to coordinate the resolution of issues related to the IGS components. These activities will address recommendations from the 2016 IGS Workshop as well as past workshops, including assessment and monitoring of station performance and data quality, generating metrics on these data.

- Data center harmonization: The working group will consider methodologies for ensuring key data sets are available at all GDCs.
- Compression: As per a recommendation from past IGS workshops, the DCWG will develop a plan for the introduction of a new compression scheme into the IGS infrastructure by evaluating tests of available tools, surveying the IGS infrastructure, making a recommendation on a new IGS compression scheme, and coordinating recommendations with the IC to develop implementation schedule. Ideally, the new compression scheme will be made part of the RINEX V3 file naming implementation.
- Next meeting: A meeting of the DCWG is planned for the next IGS workshop in 2016.

4 Membership

- Carey Noll (NASA GSFC/USA), Chair
- Yehuda Bock (SIO/USA)
- Fran Boler (UNAVCO)
- Ludwig Combrinck (HRAO/South Africa)
- Bruno Garayt (IGN/France)
- Kevin Choi (NOAA/USA), ex-officio
- Heinz Habrich (BKG/Germany)
- Michael Moore (GA/Australia)
- Ruth Neilan (JPL/USA), ex-officio
- Markus Ramatschi (GFZ/Germany)
- Nacho.Romero (ESA/Germany)
- Mike Schmidt (NRCan/Canada)
- Giovanni Sella (NOAA/USA)
- Grigory Steblov (RDAAC/Russia)
- Dave Stowers (JPL/USA)