

IGS Data Center Working Group

Carey E. Noll

Solar System Exploration Data Services Office
NASA Goddard Space Flight Center, Code 690.1
Greenbelt, MD 20771

Introduction

The IGS Governing Board recommended the formation of a working group to focus on data center issues at its December 2001 meeting in San Francisco. This working group hopes to tackle many of the problems facing the IGS data centers as well as develop new ideas to aid users both internal and external to the IGS. The IGS Data Center Working Group (DCWG) will address issues relevant to effective operation of all IGS data centers, operational, regional, and global. Some of these issues include:

- effective data flow
- backup of the operational data flow
- security issues at data centers
- consistency of data holdings among data centers
- timely archive and dissemination of data as the IGS moves into a real-time mode for selected products

A web site has been developed (<http://cddis.gsfc.nasa.gov/igsdc>) for the working group. This website contains the charter and list of members as well as information about current and planned activities. A mailing list (igs-dcwg@igsch.jpl.nasa.gov) is maintained at the IGS Central Bureau since June 2002 for working group communications.

Recent Activities

In 2004, a Charter for IGS Data Centers was completed and submitted to the Central Bureau for reference by the IGS Terms of Reference. This document can be used by any group wishing to join the IGS as a global, regional, or operational data center. In fact, the Korean Astronomy and Space Science Institute (KASI) submitted a proposal to the IGS in 2003 for a new global data center. The DCWG has worked with KASI staff in establishing this new data center, which will be a valued addition to the archiving activities of the IGS. KASI plans to test operations through 2005 with hopes to become a fully operational GDC in January 2006.

The DCWG is also working with the Real Time Working Group (RTWG) on the transmission of real-time GNSS data to the IGS data centers. At this time, it is unclear how the data centers can contribute to the real-time activity. Two possibilities are under consideration: acting as a relay of data to the actual real-time data users or using relaying as a way of transmitting high-rate data for archive at the IGS data centers. The later activity could replace the current file-oriented transmission of high-rate data.

The working group coordinated a "latest" directory structure at all IGS GDCs. This directory provides expert/routine users with the latest versions (several days or weeks) of IGS ultra-rapid, rapid, and final products. For example, at the CDDIS these products can easily be located in subdirectories by product type of <ftp://cddis.gsfc.nasa.gov/pub/gps/products/latest>.

Another area of discussion over the past two years concerned the type of compression utilized within the IGS. Since the start of the IGS Test Campaign in 1992, the data centers have used UNIX (LZW) compression (all files have a .Z extension). Users, particularly the IGS Analysis Centers, have coded this type of compression into their automated procedures that retrieve and analyze GNSS data. Members felt

the working group should investigate other types of compression (e.g., gzip). Ultimately, the group must interface with users to determine if a switch to another type of compression brings advantages in data storage, ease of use, and future expansion. Cross-platform compatibility issues and conversion of the older data to any new compression format must be addressed as well.

Meetings

A meeting of the working group was held in March 2004 at the IGS Symposium and Technical Workshop in Berne Switzerland. Two major topics were discussed, the long-term archive of raw data and the management of replacement data. Maintaining an archive of raw data is useful for two major reasons. Errors in RINEX conversion have occurred and require the raw data to correct. Since a majority of sites provide data to the IGS at a 30-second sampling rate, if higher rate data are required (i.e., to study past or silent earthquakes), raw data would need to be used. The working group recommended that operational data centers continue to be the source of raw GNSS data and should maintain an archive indefinitely; these data do not need to be generally accessible to the user community but should be available to users upon request.

The second major topic of discussion at the March 2004 meeting concerned how to manage replacement, retracted, or data transmitted with a large (e.g., months) delay. Discussion touched on what type of problem/change requires a replacement as well as how to notify users of these data updates. Currently, data replacement messages are sent to subscribers of the IGSStation exploder. While this method notifies subscribed users of problem data, an archived list of these data and replacement information would aid users in the long run. The group recommended circulating ideas for possible solutions and then developing a plan for future discussion.