

IGS Component Reports 2011

Component Name (IGS Real-time Working Group and IGS Real-time Pilot Project):

Date of establishment: RTWG: 2001; RTPP: 2007

Chair: Mark Caissy, Natural Resources Canada, Canada, caissy@nrcan.gc.ca

Working Group Membership:

Loukis Agrotis (ESA)
Lou Estey (UNAVCO)
Georg Weber (BKG)
Martin Schmitz (GEO++)
Gerhard Wubbena (GEO++)
Ken Macleod (NRCan)
Alvaro Mozo Garcia (GMV)
Manuel Hernandez-Pajares (UPC)
Andre Hauschild (DLR)
IGS Working Group Chairs
IGS Analysis Center Representatives
ex officio: R. Neilan (JPL), Jim Ray (NGS)

Pilot Project Participants:

RTPP(Station Operators): www.rtigs.net/rtp_p_stationOperators.php
RTPP(Data Centers): www.rtigs.net/rtp_p_DCs.php
RTPP(Analysis Centers): www.rtigs.net/rtp_p_A_Cs.php
RTPP(Associate Analysis Centers): www.rtigs.net/rtp_p_AACs.php
RTPP(Analysis Center Coordinator): www.rtigs.net/rtp_p_ACC.php
RTPP(Network Management/Monitoring): www.rtigs.net/rtp_p_NC.php
RTPP(Users): www.rtigs.net/rtp_p_users.php

Working Group Charter: Current charter was adopted in 2010 for the period 2011 - 2012

Activities in 2011:

The Working Group and members of the Pilot Project focused on the goals outlined in the charter. These goals are consistent with implementing the recommendations from the Newcastle workshop.

Goal #1: -- To initiate, among members of the Pilot Project, the delivery of an IGS Real-time GPS Correction Product (Initial Operating Capability). Target date: June 2011.

-- This goal was accomplished in August with the creation of two separate GPS clock combinations, one at ESOC and the other at NRCAN.

Goal #2: -- To increase the number of Real-time Analysis Centers generating real-time Glonass clocks to four or more. Target date: December 2011.

-- Three Centers are generating GPS+Glonass solutions and these solutions are being combined at BKG. Orbit, clock and PPP statistics will be assessed for this new combined product. Additional GPS+Glonass contributions are needed and expected in the future.

Goal #3: -- To routinely create hourly 30-second RINEX files at Regional Real-time Data Centers. These RINEX files will be created from RTCM Multiple Signal Message streams coming from a subset of reference frame stations. These files will then be uploaded to all Global Data Centers. Target date: December 2011

-- We are on track with this goal. BKG has developed an application to convert manufacturer proprietary streams into RTCM MSM streams. These streams can be uploaded to an NTRIP Caster for access by users and they can also be written as RINEX format files. NRCAN is modifying the GNSSR software to generate RTCM MSM streams at tracking stations, a development that will be completed in December 2011. These streams will be made available to receiver manufacturers allowing them to test the interoperability of RTCM MSM data. RINEX version 3.x formatted files, generated from these streams can be made available at Global Data Centers.

Goal #4: -- To initiate, among the members of the Pilot Project, the delivery of real-time GNSS data and an IGS Real-time GPS Correction Product, both at full operating capability. Target date: June 2012.

-- This goal and target date remain unchanged. Between now and April 2012 the RTWG will be identifying and closing any gaps preventing us today from reaching this milestone. A status report on this activity will be presented at the Vienna governing board meeting.

Goal #5: -- To recommend to the IGS Governing Board, in December 2012, that it begin to offer real-time products as part of its IGS services.

-- Within the Pilot Project we have begun to fast track this goal. We believe we can have the IGS in a position to begin offering an FOC real-time GNSS data and correction service in the June/July 2012 timeframe. We plan to make this recommendation at the governing board meeting in April 2012.

Key accomplishments in 2011:

Two teleconferences were held in 2011 where all RTPP participants were invited. Minutes were disseminated to the RTWG mailing list:

- June 2011
- November 2011

The RTWG attended three RTCM meetings in 2011.

- February 2011 -- Loukis Agrotis
- May 2011 -- Ken MacLeod
- September 2011 – Ken MacLeod

RTCM -- SSR (State Space Representation)

This new GNSS correction format became an official RTCM standard in the 3rd week of May.

RTCM – MSM (Multiple Signal Messages)

All issues pertaining to MSM were resolved over the course of the three RTCM meetings attended by either Loukis or Ken. The format will now undergo testing by the manufacturers and it is hoped that this will be completed before the May 2012 meeting so the format can be voted on for adoption as a new RTCM standard.

New Pilot Project Contributions

Wuhan joined the pilot project as a real-time analysis center.
Fugro and JPL joined the pilot project as contributors of tracking station data.

Ambiguity Resolution

A mini-group on ambiguity resolution in PPP has been created during the 2010 workshop under Maorong Ge. One teleconference among group members was held in February. GFZ and CNES have initiated websites for demonstrating results from these techniques. CNES has proposed technique-independent data dissemination formats. Future challenges are the adoption of techniques and formats (possibly via RTCM) and understanding how to use these techniques in the presence of patents to CNES and NRCAN.

First RT Global Iono VTEC Maps produced (Hernandez-Pajares, Jakowski)

Presentations :
EGU General Assembly 2011

“The IGS Real-time Pilot Project – The Development of Real-time IGS Correction Products for Precise Point Positioning”

Mark Caissy (1), Georg Weber (2), Loukis Agrotis (3), Gerhard Wübbena (4), and Manuel Hernandez-Pajares (5)

IUGG 2011

“Real-time Combination of GNSS Orbit and Clock Correctors for Precise Point Positioning”

Georg Weber, Leos Mervart, Loukis Agrotis, Andrea Stürze

New Activities (2012) -- M-GEX Campaign

The Real-time Working Group will be enabling real-time contributions to the M-GEX Campaign. Goal #3 (above) -- To routinely create hourly 30-second RINEX files at Regional Real-time Data Centers is consistent with the type of support that will be provided.

Real-time RTCM MSM streams will be available at NTRIP casters operated by a number of agencies contributing to the Real-time Pilot Project.

Software tools will be available to:

- manage high rate GNSS data - multiple constellations
 - conversion tools --> receiver proprietary formats to RTCM MSM
 - both BKG and NRCAN have developed tools for this purpose
 - high rate Rinexing --> RTCM MSM to Rinex

Continued Activities (2012)

The main activities will focus on the transition from a pilot project into an official IGS service by the end of July 2012.

Steps:

1. Identifying and closing any gaps preventing us today from reaching this target.
2. Get a confirmation from organizations participating in the pilot project that they will continue to make the same contributions to the new Real-time IGS Service.
3. Prepare a status report to be presented at the Vienna governing board meeting.
4. Develop a communication strategy for the launch of the new service.

Post 2012

The Real-time Working Group should continue in a support role to the real-time service focussing on the continued development and enhancement of the service.

IGS Real-time Working Group and Pilot Project Charter Period 2011-2012

The IGS Real-time Working group was established in 2001 with a charter that stated that the group was to design and implement real-time IGS infrastructure and processes. The goals of the working group were to be accomplished in two phases which are now completed. This new charter establishes a new set of goals for the period of January 2011 to December 2012.

In June 2007 the IGS announced a Call For Participation (CFP) in an IGS Real-time Pilot Project. The Pilot Project was to exist for a period of three years ending in 2010. In 2009 it was recommended that the Pilot Project be extended to March 2011. The goal of the Pilot Project is to work towards the incorporation of real-time infrastructure and processes into the day to day operation of the IGS and it is doing so by continuing to focus on the key objectives outlined in the CFP. The eventual goal of the Pilot Project is to prove that the IGS has the capacity to deliver real-time products as part of its service.

This new charter consolidates the work of both the participants in the Pilot Project and the Working Group members and it establishes a list of goals for the period of January 2011 to December 2012. The ultimate goal of this consolidated effort, during this defined period of time, is to clearly demonstrate that the International GNSS Service has the capacity to offer real-time GNSS data and real-time GPS orbits and clocks in its day to day operation. Under this framework the Pilot Project will demonstrate the existing real-time capabilities within the main components of the IGS. The Working Group will focus on enhancing and extending these capabilities by focusing on the recommendations from both the Miami and Newcastle workshops.

The following is the list of goals for the period of January 2011 to December 2012.

Goal #1: -- To initiate, among members of the Pilot Project, the delivery of an IGS Real-time GPS Correction Product (Initial Operating Capability). Target date: June 2011.

Goal #2: -- To increase the number of Real-time Analysis Centers generating real-time Glonass clocks to four or more. Target date: December 2011.

Goal #3: -- To routinely create hourly 30-second RINEX files at Regional Real-time Data Centers. These RINEX files will be created from RTCM Multiple Signal Message streams coming from a subset of reference frame stations. These files will then be uploaded to all Global Data Centers. Target date: December 2011

Goal #4: -- To initiate, among the members of the Pilot Project, the delivery of real-time GNSS data and an IGS Real-time GPS Correction Product, both at full operating capability. Target date: June 2012.

Goal #5: -- To recommend to the IGS Governing Board, in December 2012, that it begin to offer real-time products as part of its IGS services.

Working Group Membership (December 2010)

- Mark Caissy (NRCan) Chair
- Loukis Agrotis (ESA)
- Pedro Alfaro (ESA)
- Lou Estey (UNAVCO)
- Georg Weber (BKG)
- Martin Schmitz (GEO++)
- Gerhard Wubbena (GEO++)
- Ken Macleod (NRCan)
- Alvaro Mozo Garcia (GMV)
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- Andre Hauschild (DLR)
- IGS Working Group Chairs
- IGS Analysis Center Representatives
ex officio: R. Neilan (JPL), Jim Ray (NGS)

The working group membership may change in order to meet technical needs.

A list of Pilot Project Participants is maintained at the projects home page www.rtigs.net