Possible redefinition of UTC

Felicitas Arias (BIPM)

9th Meeting of UTC contributing laboratories
BIPM, 12 September 2012
Responsibilities on timescales

• General Conference on Weights and Measures (CGPM)
  – Defines of the second (units in general)
  – Adopts International Atomic Time (TAI)
  – Endorses UTC
• International Telecommunication Union (ITU)
  – Fixes de rules for t&f dissemination by signals
  – Rec ITU-R TF-460.6 (describes the process for synchronizing UTC to UT1 better than 1s)
• International Bureau of Weights and Measures (BIPM)
  – Calculates UTC based on data provided by ~70 institutes world-wide spread, coordinates activities for accomplishing this mandate
• International Earth Rotation and Reference Systems Service (IERS)
  – Monitors the rotation of the Earth, fixes and announces the application of leap seconds
• National institutes (69) maintain local approximations to UTC, UCT(k)
### Possible redefinition of UTC without leap seconds

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>~2000</td>
<td>Discussion started at the ITU-R, SG7 Science Services, WP7A Time signals and frequency standard emissions</td>
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<tr>
<td>2000-2010</td>
<td>WP7A studied the issue, considered different options, organized an open meeting (Torino, 2003), and worked on a proposal for an amended recommendation</td>
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<tr>
<td>2010</td>
<td>The Draft Recommendation ITU-R TF.460-6 (new proposed version) was submitted by WP7A to SG7; discussion came to a « dead-end » with a 10-year opposition from one administration, plus 2 more administrations joining this position</td>
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<tr>
<td>2011</td>
<td>SG7 sent the Draft Recommendation to the Radiocommunication Assembly 2012 (January) for « final decision »</td>
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<tr>
<td>2012</td>
<td>RA 2012 put back the recommendation to SG7-WP7A for a final decision at WRC 2015 – WRC 2012 Resolution 653 on the feasibility of a continuous UTC and involves the BIPM, CCTF, CGPM, IAU, IUGG, URSI, and other international organizations.</td>
</tr>
</tbody>
</table>
Contributions to the discussion

• Dissemination of information
  – Metrologia Special Issue “Modern Time Scales”, August 2011
    • 14 articles; F. Arias, W. Lewandowski (eds.)
  – Royal Society Discussion Meeting, January 2012, London area
    • Invited participants only; T. Quinn, F. Arias (organizers)

• ITU-R
  – WP7A
  – BIPM representation at Radiocommunication Assembly 2012
  – Radiocommunication Bureau Seminar for RCC countries and Baltic States (this week)
  – ITU Seminar for Americas Region (20-21 Sept 2012)

• IAU GA 2012 (Beijing, August 2012)
  – Division I Working Group on UTC
    • A draft document representing the IAU position on redefinition of UTC for submission to the ITU
Possible redefinition of UTC without leap seconds

* Access to UT1 is required for many applications

Questions for analysis:

- Is the UTC system with leap seconds **still necessary**?
- For which users UTC is **the only way** to approximate UT1?
- Which are the drawbacks of using the **IERS predictions of UT1-UTC** for accessing to UT1?
- [Decorrelation with the solar regime in human activities? (does correlation really exist?) ]
- **Is the ITU the place for making recommendations on the definition of timescales?**
  - Authority for fixing rules and procedures for time and frequency signals emmission
  - The international metrology coordination system would be more appropriate
Timing Dialog

TRAIM Parameters:
- TRAIM Enabled
- TRAIM Alarm Limit: 3 x 100ns
- Output Rate: 0

1PPS Mode:
- 1PPS on all the time

1PPS Timing:
- 1PPS Time Offset: 0 ns
- 1PPS Antenna Cable Delay: 0 ns

GMT Correction:
- + 0 : 0

Pulse Interval:
- 1 PPS
- 100 PPS

- GPS Time
- UTC Time

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**Time:** 06:50:00 UTC

**Time:** 06:50:16 GPS