NTP

Network Time Protocol

What is NTP and to what extent is it currently useful for Video Occultation Observations?

Presented to TTSO8

Monday, 21st April 2014

By Dave Gault

Slide 1) **Title Screen**

- No description

Slide 2) **What is NTP?**

- Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data network. Source= Wiki
- Diagram shows stratum 0 is atomic clocks & GPS
- Stratum 1 clocks connected to Stratum 0 by RS 232 serial.
- Stratum 1 clocks and below support cross checking.
- NTP may drop a clock from service if it's error is too large or the connection is poor.

Slide 3) **NOT the Windows Clock for Occultation Timing**

- While the windows system clock uses NTP technology, it is only good for "every-day" use, like system file maintenance records.
- Not suitable for occultation work.
- Shown is is a photo that shows a 0.4442 second delay after a recent re-sync operation.
  - UT supplied by IOTA-VTI.

Slide 4) **For NTP to be accurate:**

It needs to cope with asymmetry and network latency.

- The left picture shows that the speed of a typical internet connection is asymmetric – 2337kbps down and 385 kbps up.
- The right picture shows that the load (by other computers) on the network can effect latency.
  - 4am = no other computers on the home LAN gives better latency than;
  - 9:30am = 3 other computers consuming bandwidth results in an increase in latency.

Slide 5) **BeeperSync - Designed to synchronise a BeeperBox**

- **OK for Visual Occultation Observations.**
  - Designed to synchronise it's own clock using NTP and then to synchronise a BeeperBox using a parallel port.
  - Does not attempt to synchronise the PC clock.
  - Reports on timing accuracy; essential to gauge quality of NTP fix.

Slide 6) **OccuRec and NTP**

- Ref: OccuRec presentation by Hristo Pavlov.
- OccuRec will OCR the IOTA-VTI timestamp and uses 4 NTP servers

Slide 7) **OccuRec and NTP testing**

- Some examples of NTP testing using OCR'd IOTA-VTI timestamps.
- Testing continues…

Slide 8) **Raspberry Pi + GPS with 1pps**

- = Stratum 1 NTP Server?
- Testing continues…