# A low-cost platform for traceable time and frequency

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# APMP Technical Committee Initiative

## APMP Technical Committee for Time and Frequency

2014 meeting (Daejeon, Korea)

| | |
|---|---|
| NPLI | India |
| NMI | Australia |
| NML-SIRIM | Malaysia |
| NIMT | Thailand |
| NIM | China |
| NICT | Japan |
| MUSSD | Sri Lanka |
| TL | Chinese Taipei |
| KRISS | Korea |
| NICT | Japan |
| VMI | Vietnam |
| KIM-LIPI | Indonesia |
| NMISA | South Africa |

http://www.apmpweb.org/fms/general.php?tc_id=TF

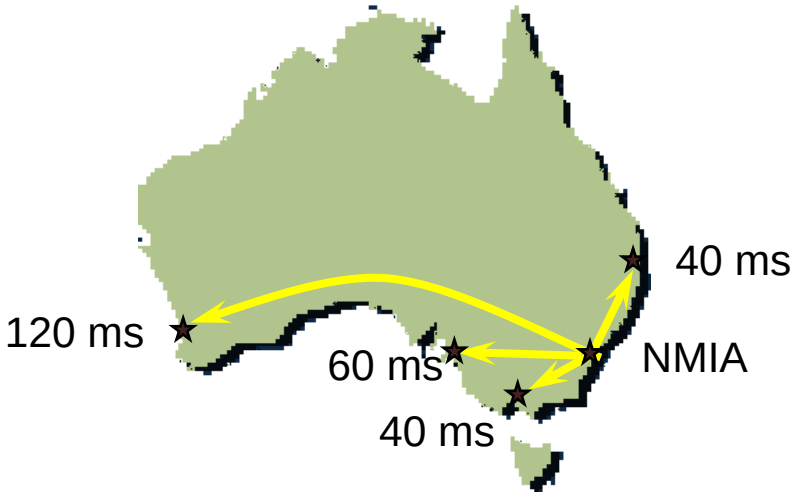
# Aims of the project

- Low cost (< $2K for basic system)
- Produce CGGTTS data files
- Ease of customization - all hardware designs and software openly available
- Easily extended to new receivers
- Develop technical capabilities in NMIs
- Support development of services

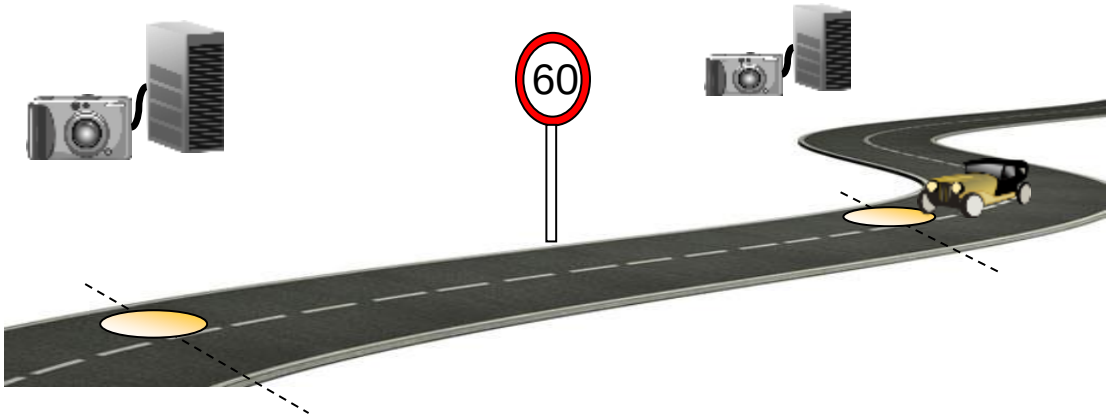
Only 18 months for the project so it is based on a system that NMIA has been using for a number of years.

# Applications

## Time-of-day service via NTP

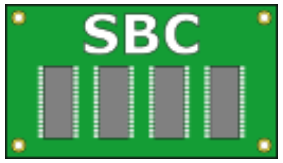



## Time-of-day auditing




Point-to-point speed measurement

# Reference platform



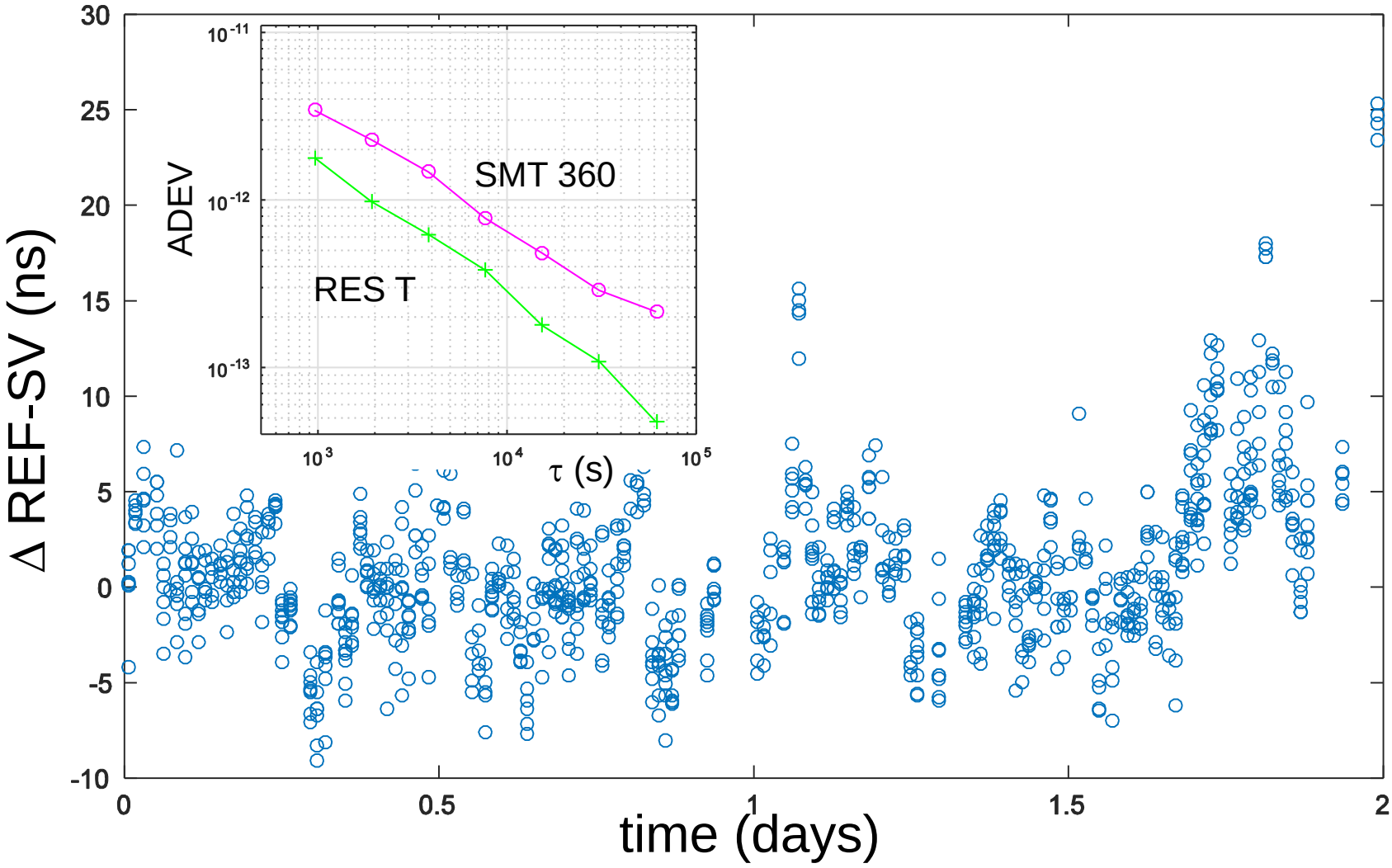

Low-cost, ARM based Linux computer (Raspberry Pi, BeagleBone Black)


FPGA used for multi-channel time-interval measurement


GPS receiver for GPSCV – currently evaluating Trimble Resolution SMT 360


GPSDO for local reference

# Time-transfer performance - Common-clock comparison of Javad and SMT 360



# Resources and software


Open Traceable Time Platform

www.openttp.org

Software repository hosted on **GitHub**

https://github.com/openttp

(current software is in the ‘develop’ branch)

# Thank you for your attention!

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