



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

Status report 2016: current and future activities at NMIA

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APMP TCTF meeting, Da Nang Viet Nam, 14-15th November 2016

Who we are and what we do



4 full-time staff

Calibration inc. optical frequency

Consulting

Training

R&D



Clocks and time-transfer equipment

Clocks and oscillators

5 x HP5071 (standard tubes)
2 x H-maser (in-house built, off line)

UWA cryogenic sapphire oscillator

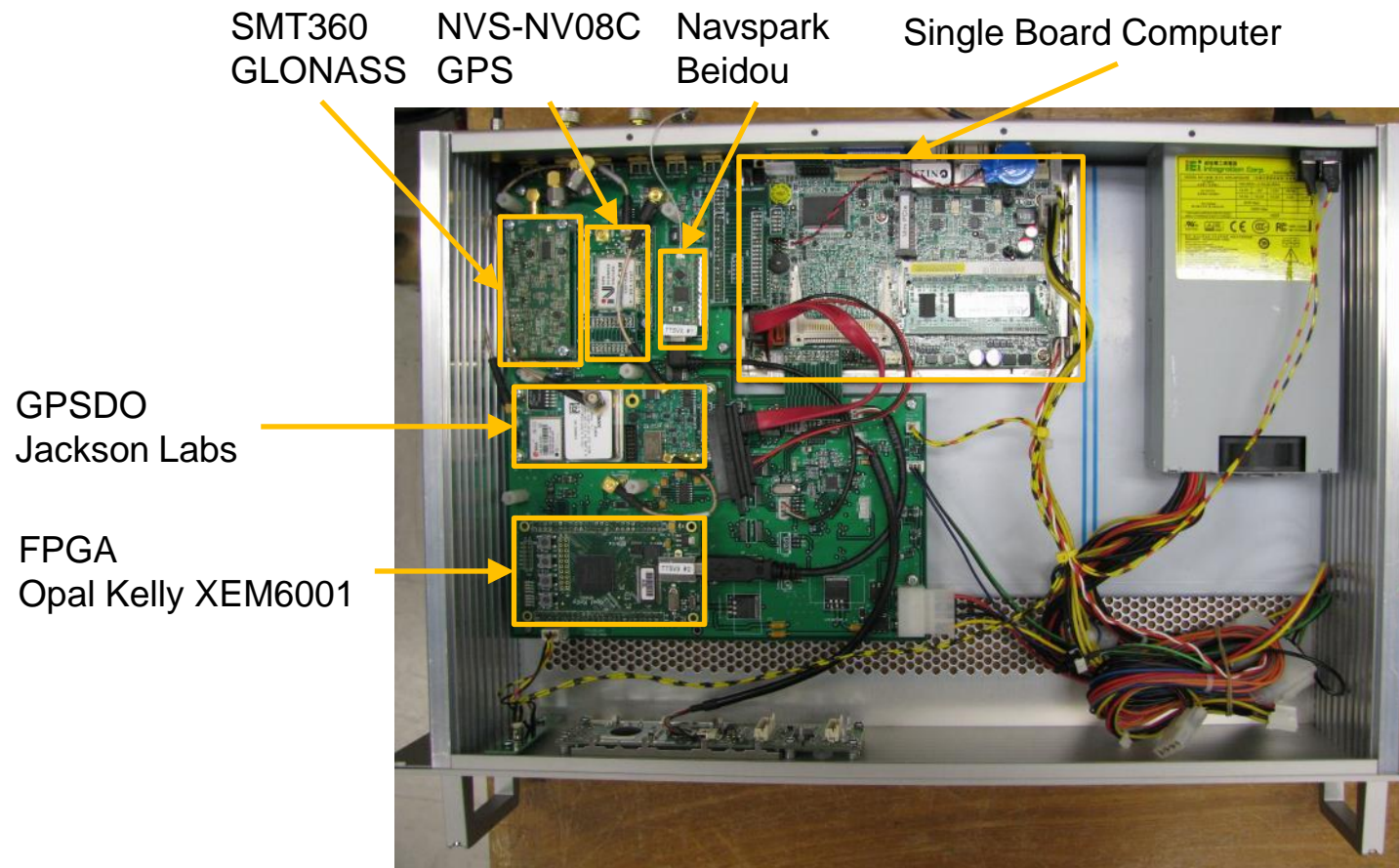
Time-transfer equipment

1 x Topcon GGD
1 x Septentrio 2
2 x Septentrio PolaRxTR4 Pro

Satre TWSTT modem

GNSS activities

Multi-GNSS system



GNSS activities

Low-cost system for TC initiative



GNSS activities

Refurbishment of APMP travelling receiver



GNSS activities

Supporting traceable use of GNSS devices

Provided advice to the Australian accreditation body NATA on the use and traceability of GNSS devices.

To support the use of GNSS, will initially set up GNSS (GPS, GLONASS, Beidou) monitoring at Sydney, and then publish data.

Monitoring will be extended to other capital cities as existing NTP server infrastructure is upgraded.

Web timer for verification of stopwatches



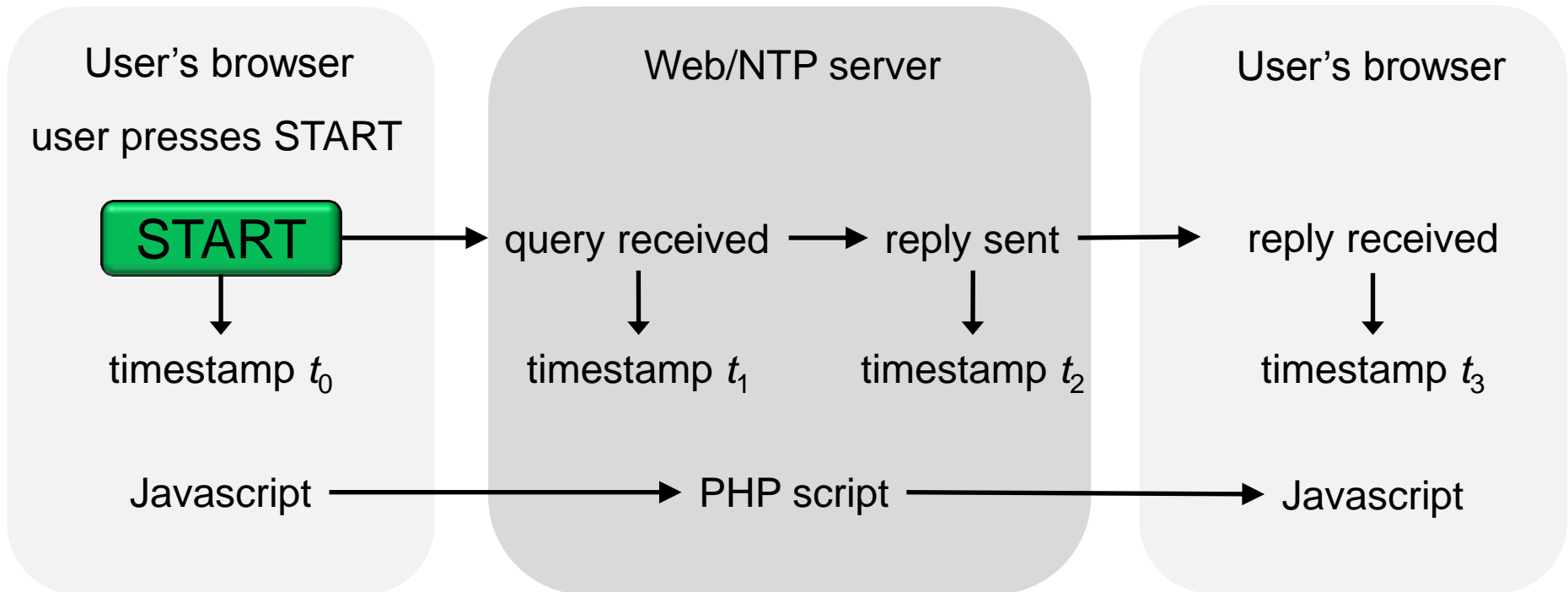
NATA, the Australian accreditation body, requires that stopwatches used in test and calibration laboratories be checked for correct operation every 6 months. This applies to about 3000 laboratories.

Until recently, the Speaking Clock service was recommended as a suitable reference. Traceability and accreditation for this service was provided through NMIA, but this is no longer the case.

As an alternative, we have suggested a method using NTP but this is somewhat technical and not convenient for some users.

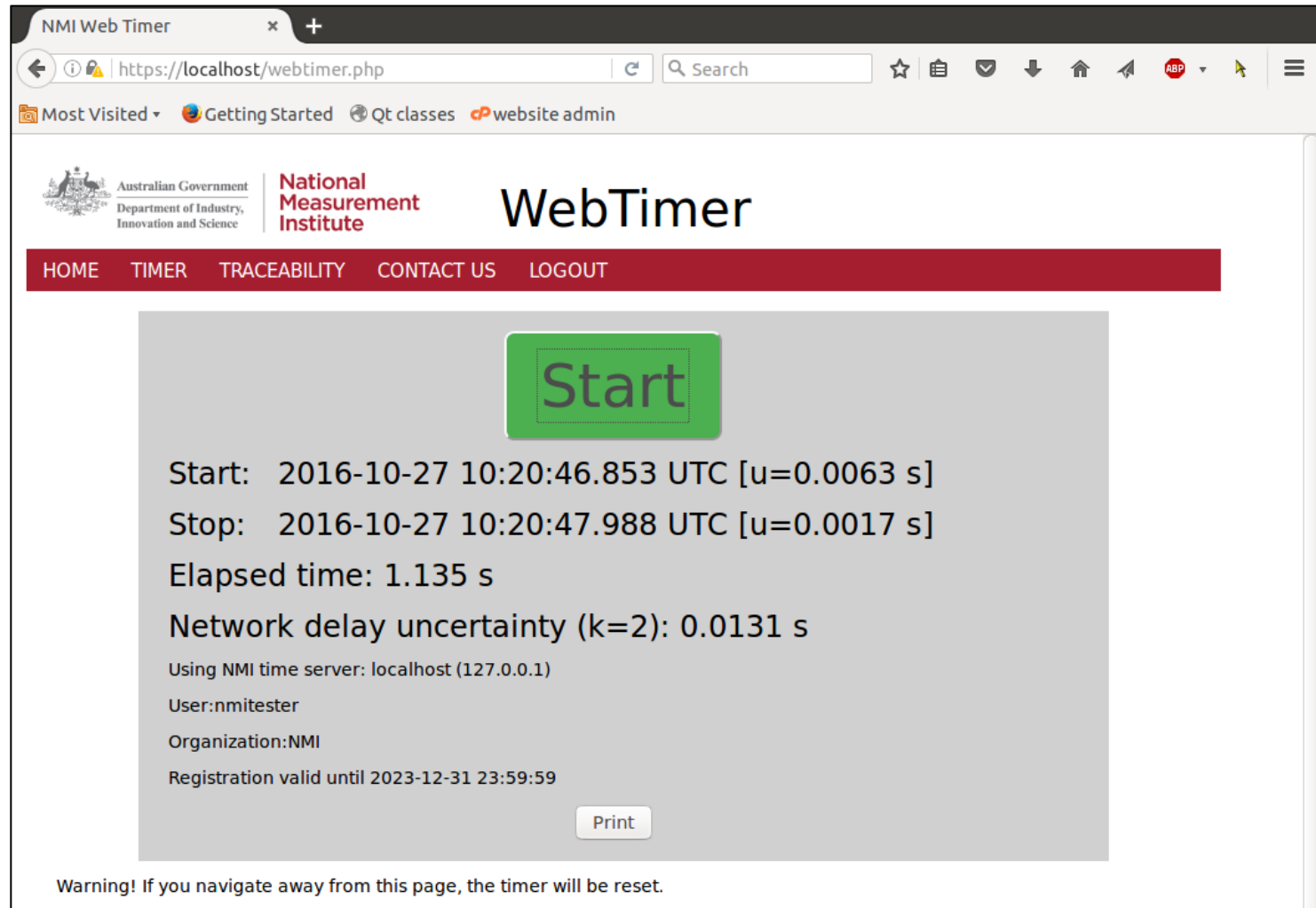
Web timer Implementation

Delay estimation is based on the NTP time stamping model



Web timer

What it looks like



The screenshot shows a web browser window with the title "NMI Web Timer" and the URL "https://localhost/webtimer.php". The browser's address bar includes a search field and various icons. Below the browser window, the web application header features the Australian Government logo, the text "Australian Government Department of Industry, Innovation and Science", the "National Measurement Institute" logo, and the title "WebTimer". A red navigation bar contains links for "HOME", "TIMER", "TRACEABILITY", "CONTACT US", and "LOGOUT". The main content area displays a large green "Start" button. Below the button, the timer results are shown: "Start: 2016-10-27 10:20:46.853 UTC [u=0.0063 s]", "Stop: 2016-10-27 10:20:47.988 UTC [u=0.0017 s]", "Elapsed time: 1.135 s", "Network delay uncertainty (k=2): 0.0131 s", "Using NMI time server: localhost (127.0.0.1)", "User:nmitester", "Organization:NMI", and "Registration valid until 2023-12-31 23:59:59". A "Print" button is located at the bottom of the results section. A warning message at the bottom of the page states: "Warning! If you navigate away from this page, the timer will be reset."

NMI Web Timer

https://localhost/webtimer.php

Most Visited Getting Started Qt classes website admin

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Institute

WebTimer

HOME TIMER TRACEABILITY CONTACT US LOGOUT

Start

Start: 2016-10-27 10:20:46.853 UTC [u=0.0063 s]
Stop: 2016-10-27 10:20:47.988 UTC [u=0.0017 s]
Elapsed time: 1.135 s
Network delay uncertainty (k=2): 0.0131 s
Using NMI time server: localhost (127.0.0.1)
User:nmitester
Organization:NMI
Registration valid until 2023-12-31 23:59:59

Print

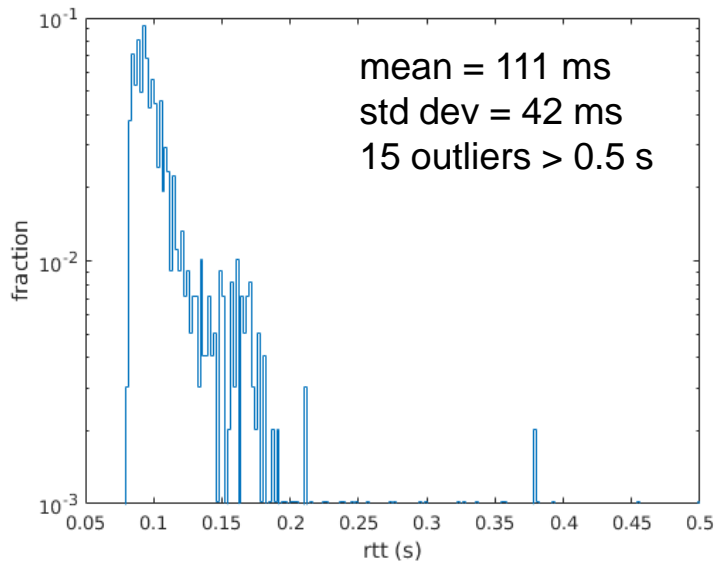
Warning! If you navigate away from this page, the timer will be reset.

Web timer Performance

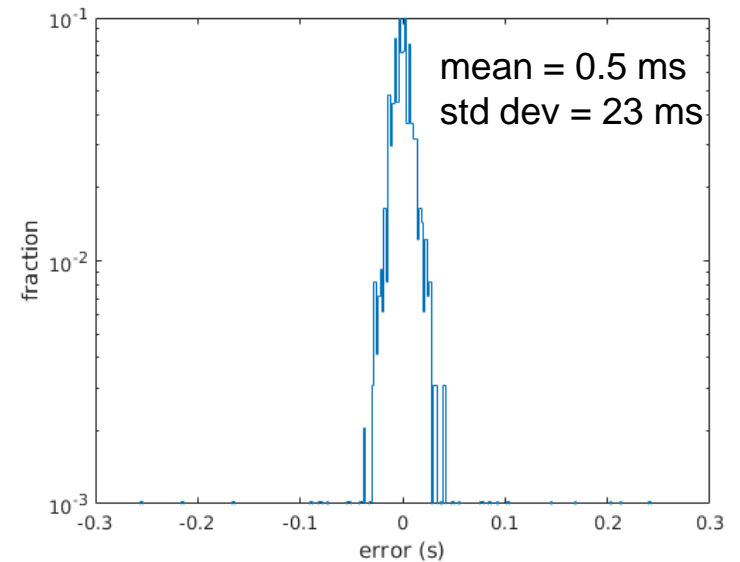


Test:
Mouse click driven by 1 pps
Server external to NMIA, ADSL connection

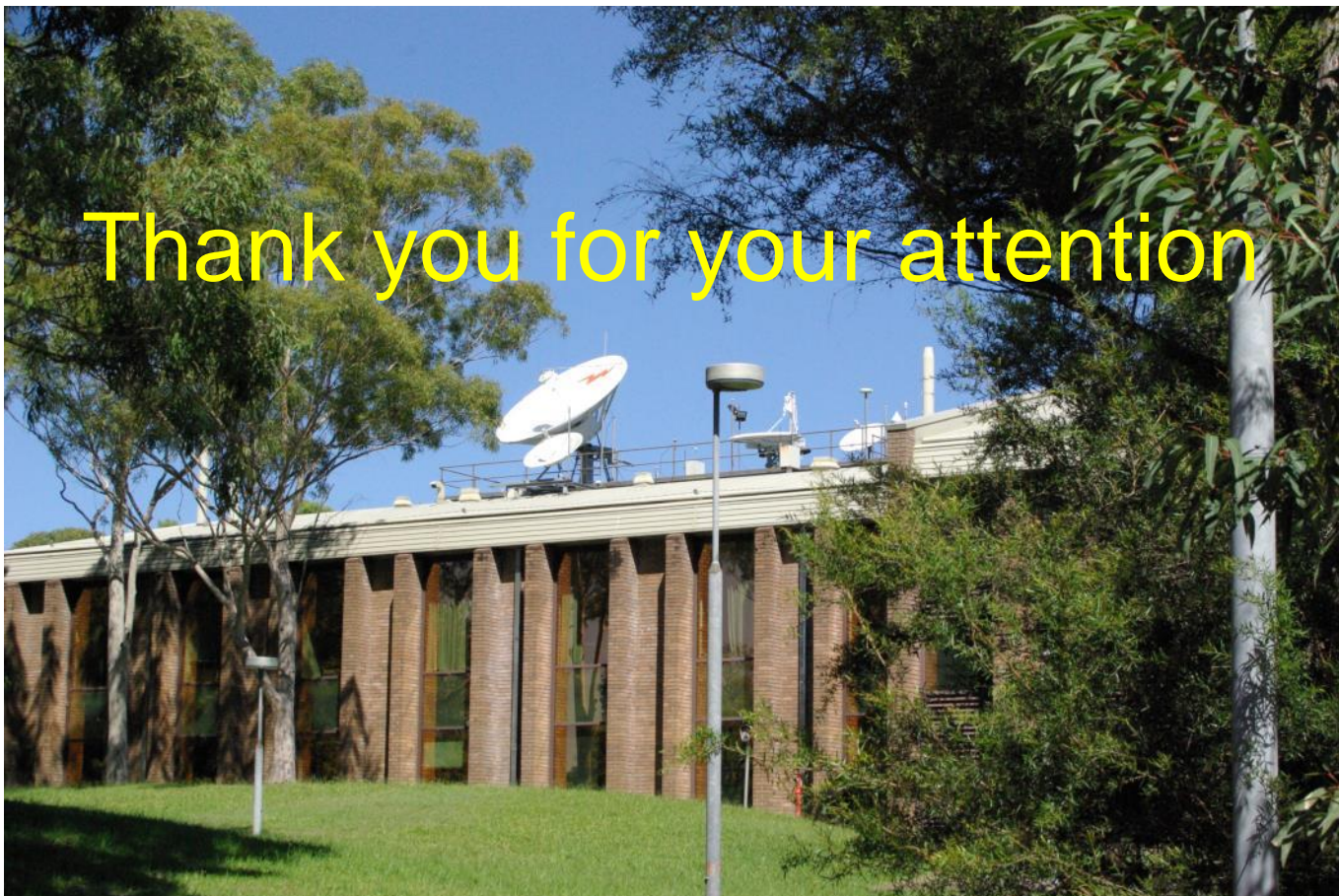
round trip time distribution ($N=1000$)



time interval error distribution ($N=1000$)



Thank you for your attention



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