A Slice of ~~Pi~~ Time

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(A Raspberry Pi Stratum-1 NTP Build)

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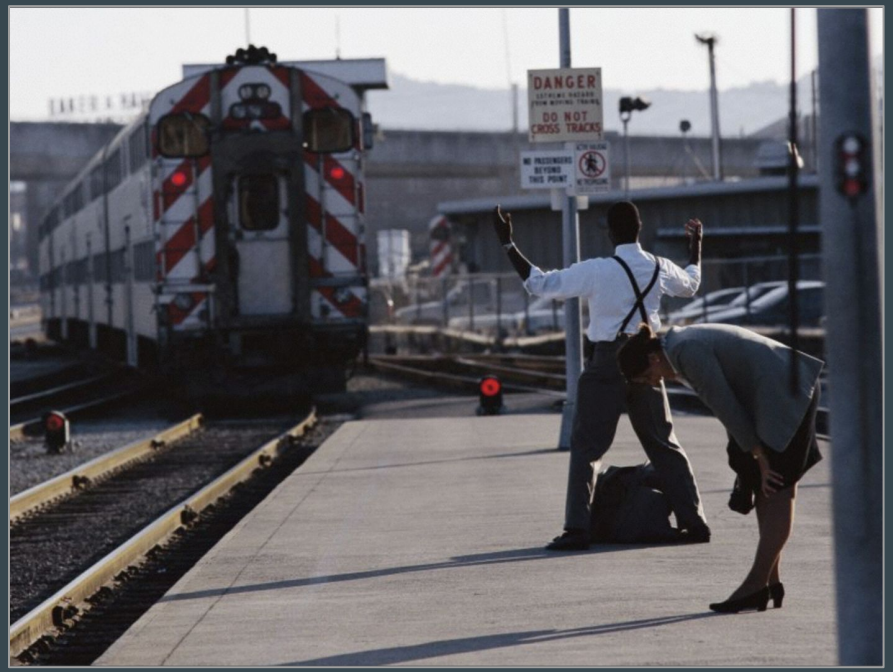
Things we'll likely talk about. Probably.

- Why?!? (..build an NTP Stratum-1 server)
- Why?!? (..use an ancient Raspberry Pi 1)
- How do you do this?
- How did *I* do this?
  - GPS hardware
  - OS / Distro
  - Other Software

Time: It's a thing.

In a Network / Infrastructure Context:

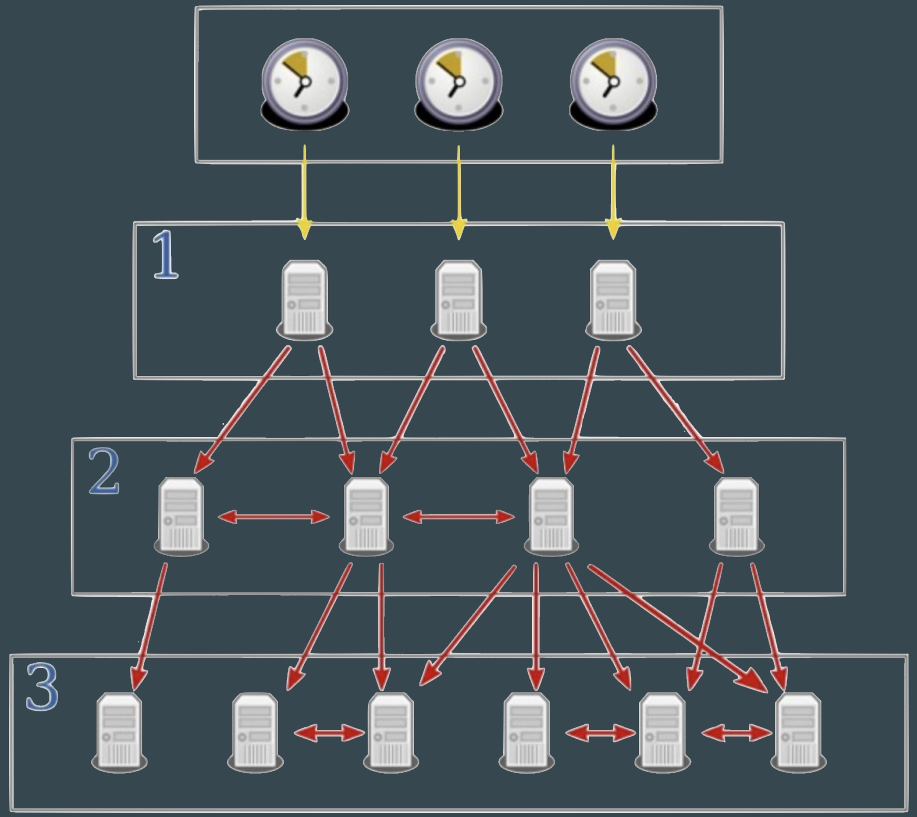
- Stats
- Logs
- Troubleshooting
- < insert reason here.. >



Enn Tee Pee (NTP)

- UDP / Port 123
- Standards:
  - RFC 5905 - NTPv4 (2015)
  - RFC 1305 - NTPv3 (2013)
  - RFC 1119 - NTPv2 (2013)
  - RFC 1059 - NTPv1 (1988)
  - RFC 958 - 1985

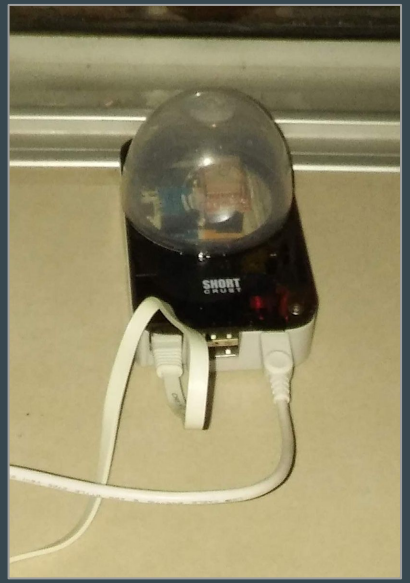
Strata



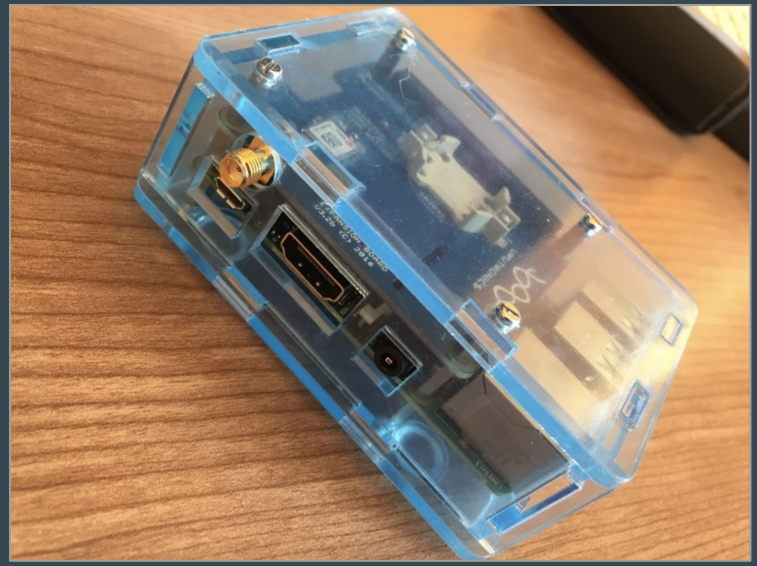
You have options...

This...

Or this...



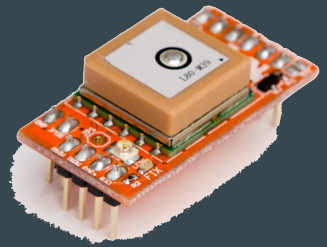
Or something like this..

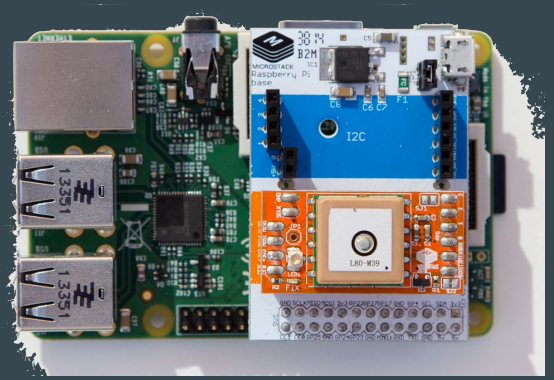


My hardware shopping list:

- Raspberry Pi 1 Model B+

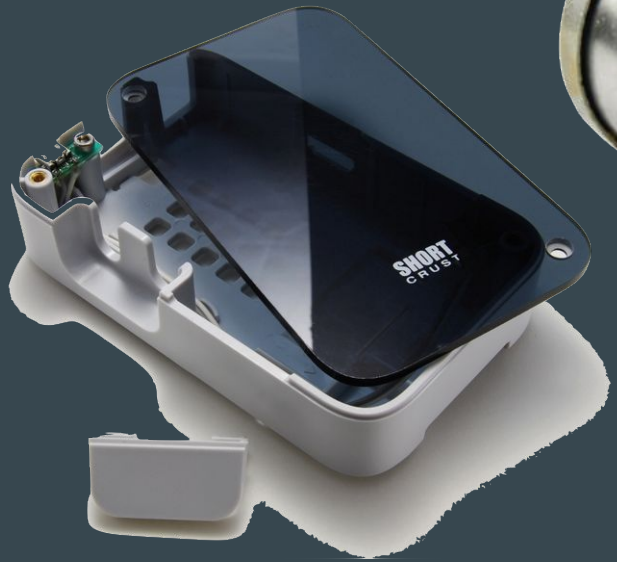
- Microstack L80 GPS Module (R 547.20)*
- Microstack Base Board Adapter (R 244.00)*





* at Pifactory, 2016

- ... and some other bits and pieces:



Software:

- Linux (OS):
  - Rasbian
  - Picore (Tinycore)
  - Kernel (?)
- NTP:
  - NTPd (ntp.org)
  - NTPng (fork)
  - Chrony
- Building:
  - Cross-compiling
  - Docker on Mac
- Monitoring:
  - Munin / MRTG
  - Netdata

Risks / Problems

- Amplification Attacks:
  - Solved problem (mostly)
  - Team Cymru
  - Except when it’s not - Netgear (and UWM)
  - OpenNTPProject.org

(some) Lessons Learned

- GPS's can take a *long* time to sync and need to "see" the sky.
- It's still useful to know about compiling kernels.
- Donating stuff can be harder work than you think.
- The pool.ntp.org folks are nice.
- There's this thing called 'PPS'.

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