Network Time Foundation
Project Status Updates
I remain very glad I was able to learn from and work closely with Dave for the past 30 years' time.

Mills first designed and implemented the Network Time Protocol in 1981, tackling the challenge of delivering synchronized time on networks.
An old friend of mine annotated this and sent it to me.

About NTF and its Projects…

(xkcd #2347, with permission)
NTF Introduction

• Harlan Stenn has actively worked on the NTP Project since the mid 90s.
• The NTP Project needed the support and backing of a legal entity.
• Harlan felt an “NTP Foundation” would have insufficient scope and decided on Network Time Foundation.
• NTF became a California Public Benefit corporation and certified as an IRS 501(c)(3) in 2011.

This slide tells a bit about how Network Time Foundation came to be. I won’t say more because it’s in the online presentation slides.
Most people are at least aware of NTP. The LinuxPTP Project’s goal is to be the best performing PTP software under the most recent Linux kernel. The libptpmgmt Project is a Type-Length-Value management and monitoring library for LinuxPTP in particular, and other PTP things as allowed. We’re spinning up 3 SyncE projects. NTF is neutral and the 3 companies that are working on open source SyncE projects under NTF’s umbrella are happy to play nice with each other. The Khronos Project’s goal is the delivery of ongoing provable bounded time limits, to prevent time-shifting attacks.
Let's discuss Khronos first because it affects at NTP and PTP. The folks who are working on Khronos have good ideas on what the threats are, how to detect them, and how to mitigate them.

Other folks are concerned that some of the proposed detection and mitigation plans are unworkable.

We’re confident that we can come up with solutions that will work for all involved.
ntp-4.2.8p18 fixes somewhere between 2 and 3 dozen bugs.

The NTP/TCP services effort is partially funded by a 2023 ARIN community grant.
We're actively identifying DDoS and abuse vectors involving NTP.

**NTP DDoS Mitigation**

DDoS Mitigation:
- Under discussion for the past year
- Real-time reporting of attacks
- Near real-time tracking of IPs that are being attacked
- **Looking for funding and beta partners**
- Once this project is moving, we'll share our results
LinuxPTP Project

- Supported profiles: default, automotive, enterprise, telecom G.8265.1, G.8275.1, and G.8275.2
- Updated documentation, including examples and common configurations
- Latest release: 4.2 on 5 December 2023
- 4.3 release scheduled for March 2024 (paint drying on TLV authentication mods)
- [https://linuxptp.nwtime.org](https://linuxptp.nwtime.org)
libptpmgmt Project

IEEE 1588-2019 Management TLV library - Also supports LinuxPTP specific TLVs
LGPL 3.0

• Current Release: 1.2 (5 December 23)
• Every class and file is documented
• Will be updated with new authentication TLVs
• https://libptpmgmt.nwtime.org
SyncE Projects

SyncE is an ITU-T standard that facilitates the transference of traceable clock signals over the Ethernet physical layer.

- synced from Renesas
- SyncESMC from SyncMonk
- ?? from Intel
- https://sync-e.nwtime.org

These projects are coming on-board and ramping up now. There will be more information on the website soon.
We get no government funding. The bulk of our funds comes from our institutional members.

Individual memberships and donations also help a lot. We use our funds to continue to improve and evolve all of our projects’ security, support services, and documentation.

We hope that the more you learn about NTF the more you’ll understand and appreciate the work we do.

The global user community relies on NTF’s technology every minute of every day.
We invite everyone to follow us and share and submit posts that are of interest to the community.

Follow NTF…

- X (Twitter): @networktimefnd
- LinkedIn: Network Time Foundation
- https://www.facebook.com/nwtime.org
- Slack Channels
  - https://www.youtube.com/@networktimefoundation
Ruthie.

Margaret likes to joke that we use cat5 cables.
An NTP volley

Server: T2 T3
Client: T1 T4

T1 Client sends, T2 Server gets, T3 Server sends, T4 Client gets.
Server ovhd: T3-T2  RTT: T4-T1-(T3-T2)
One-way time: RTT/2  (symmetric link)

If client and server are sync’d,
T3+RTT/2=T4
How does NTP work?

With a single volley, you can set your clock.
How does NTP work?

With a single volley, you can set your clock. If you send a volley, wait, and send another volley, you can see if your clock is running faster, slower, or at the same rate as the other clock. You can calculate the rate difference.
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With a single volley, you can set your clock. If you send a volley, wait, and send another volley, you can see if your clock is running faster, slower, or at the same rate as the other clock. You can calculate the rate difference.

Probably - did the remote clock change its time in the interim? Did yours?
In conclusion…

Find us at  https://nwtime.org

Wanna help us? Let us know!

https://nwtime.org/join
https://nwtime.org/donate

Questions?  info@nwtime.org