

NTP

Network Time Protocol
FR: Protocole de Temps sur reseau

About myself

Loganaden “Logan” Velvindron

**Infrastructure Security Engineer at AFRINIC,
member of the AFRINIC Infrastructure team.
(logan at afrinic.net)**

Outside of working hours:

**Core team member at hackers.mu: Mentoring
young people for Open Source & IETF, co-author
of RFC 8270, and implementor of TLS 1.3 in wget
& git, DPRIVE EDNS(0) Padding in pydig.**

Basic idea

Core details here: RFC 5905

FR: Details dans le document principal: RFC 5905

Wireformat: 64-bit timestamp: 32 bit integer part, 32 bit fraction part.

32-bit timestamps: 16-bit integer, 16-bit fraction.

FR: Format du paquet sur reseau: 32 bit entiere, 32 bit fraction.

(*Taken from OpenNTPd slides by Henning Brauer)

IETF RFC

- Propose a standard as an IETF Internet Draft**
- Submit to working group for approval**
- Either accept as working group document or reject (but can still submit as individual draft)**
- Revise and update draft as working group comments.**
- working group chair submits to IESG (if fail go back to step 4)**
- If IESG approves, ID becomes RFC.**

Timestamps & Calculations

Timestamp	ID	When generated/Generation
Originate	TS	T1 Time request sent by client
Receive	TS	T2 Time request received by server
Transmit	TS	T3 Time reply sent by server
Dest	TS	T4 Time reply received by client.

$$T (\text{local machine}) = \frac{((T2 - T1) + (T3 - T4))}{2}$$

Wireshark Practical session

[Practical session of 30-40 minutes to see NTP traffic happening over the wire]

Wireshark 2.4 minimum

Linux/BSD VM in NAT mode

Task

Draft-ietf-ntp-data-minimization-00

4.2. Transmit Timestamp Randomization

While this memo calls for most fields in client packets to be set to zero, the transmit timestamp is randomized. This decision is motivated by security as well as privacy.

Implementations to work on

Python: <https://github.com/Tipoca/ntplib/>

Pre-requisite

- Introduction to NTP protocol (2 hours video)
- Introduction to ntplib (2 hours video)
- Reading IETF draft (<https://tools.ietf.org/html/draft-ietf-ntp-data-minimization-01>) (2 hours video)