



**Internet
Society**

NTP DRAFT

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NTP

About

- Network Time Protocol is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks.

Security & Privacy

- There is unnecessary identifying information with no purpose received at the server side from the clients
- There is a blind spoofing of unauthenticated server responses.

PROPOSED MODIFICATION

- This is a fully backwards-compatible proposal. It calls for no changes on the server side, and clients which implement these updates will remain fully interoperable with existing servers.
- The Transmit Timestamp field SHOULD be set uniformly at random, generated by a mechanism suitable for cryptographic purposes.
- All other header fields, specifically the Stratum, Root Delay, Root Dispersion, Reference ID, Reference Timestamp, Origin Timestamp, and Receive Timestamp, SHOULD be set to zero.

TOOLS USED

- OS : UBUNTU 18
- Programing Language : Python
- Network Monitoring : Wireshark

OUTPUT

```
7 4.819677826 192.168.63.128 168.167.71.137 NTP 90 NTP Version 2, client
8 5.073034963 168.167.71.137 192.168.63.128 NTP 90 NTP Version 2, server
9 5.074805278 192.168.63.128 168.167.253.10 NTP 90 NTP Version 2, client

▶ Flags: 0x13, Leap Indicator: no warning, Version number: NTP Version 2, Mode: client
Peer Clock Stratum: unspecified or invalid (0)
Peer Polling Interval: invalid (0)
Peer Clock Precision: 4294967296.000000 sec
Root Delay: 0 seconds
Root Dispersion: 0 seconds
Reference ID: NULL
Reference Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Origin Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Receive Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Transmit Timestamp: Nov 7, 1975 16:42:11.772972106 UTC

8 5.073034963 168.167.71.137 192.168.63.128 NTP 90 NTP Version 2, server
9 5.074805278 192.168.63.128 168.167.253.10 NTP 90 NTP Version 2, client

▶ Flags: 0x14, Leap Indicator: no warning, Version number: NTP Version 2, Mode: server
Peer Clock Stratum: secondary reference (2)
Peer Polling Interval: invalid (3)
Peer Clock Precision: 0.000000 sec
Root Delay: 0.303451538085938 seconds
Root Dispersion: 0.0449981689453125 seconds
Reference ID: 66.220.9.122
Reference Timestamp: May 10, 2018 11:15:34.888990001 UTC
Origin Timestamp: Nov 7, 1975 16:42:11.772972106 UTC
Receive Timestamp: May 10, 2018 11:23:56.350967448 UTC
Transmit Timestamp: May 10, 2018 11:23:56.350973854 UTC
```

```
10 4.055151293 192.168.63.128 168.167.71.140 NTP 90 NTP Version 2, client
19 9.068322954 192.168.63.128 168.167.253.19 NTP 90 NTP Version 2, client
22 9.243177968 168.167.253.19 192.168.63.128 NTP 90 NTP Version 2, server
```

```
.....
Flags: 0x13, Leap Indicator: no warning, Version number: NTP Version 2, Mode: client
Peer Clock Stratum: unspecified or invalid (0)
Peer Polling Interval: invalid (0)
Peer Clock Precision: 4294967296.000000 sec
Root Delay: 0 seconds
Root Dispersion: 0 seconds
Reference ID: NULL
Reference Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Origin Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Receive Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Transmit Timestamp: Feb 21, 1977 21:39:47.845118045 UTC
```

```
24 5.503634090 192.168.63.128 168.167.253.19 NTP 90 NTP Version 2, client
26 5.761069888 168.167.253.19 192.168.63.128 NTP 90 NTP Version 2, server
27 5.763280083 192.168.63.128 168.167.71.140 NTP 90 NTP Version 2, client
```

```
.....
Flags: 0x13, Leap Indicator: no warning, Version number: NTP Version 2, Mode: client
Peer Clock Stratum: unspecified or invalid (0)
Peer Polling Interval: invalid (0)
Peer Clock Precision: 4294967296.000000 sec
Root Delay: 0 seconds
Root Dispersion: 0 seconds
Reference ID: NULL
Reference Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Origin Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Receive Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Transmit Timestamp: Jul 26, 2012 10:32:46.219044208 UTC
```

```
19 6.824107517 192.168.63.128 168.167.71.140 NTP 90 NTP Version 2, client
20 7.083759277 168.167.71.140 192.168.63.128 NTP 90 NTP Version 2, server
21 7.085070278 192.168.63.128 168.167.71.140 NTP 90 NTP Version 2, client
```

```
.....
Flags: 0x13, Leap Indicator: no warning, Version number: NTP Version 2, Mode: client
Peer Clock Stratum: unspecified or invalid (0)
Peer Polling Interval: invalid (0)
Peer Clock Precision: 4294967296.000000 sec
Root Delay: 0 seconds
Root Dispersion: 0 seconds
Reference ID: NULL
Reference Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Origin Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Receive Timestamp: Jan 1, 1970 00:00:00.000000000 UTC
Transmit Timestamp: Jun 26, 1998 09:28:20.961478233 UTC
```

WHAT IS NEXT

- Reach zero delay between the NTP client and the NTP synchronization server.
- More minimization of the fields transmitted from client to NTP server
- May we find a way to encrypt the communication between client and the synchronization server.



**“Well done is better than
well said.”**

-Benjamin Franklin

