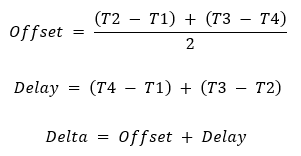
NTP has been used to synchronize time in variable response networks since 1985 and that makes it one of the oldest Internet protocols. Uses UDP OSI layer 4 protocol and port 123. By default, it achieves an accuracy of 10 ms to 200 µs, depending on the quality of the connection.

NTP uses a hierarchical system called "*stratum*". Server of type *stratum* 0 obtains the most accurate time, for example, from a cesium clock, but is not intended for time distribution to the network. This is done by the server of type *stratum* 1, which it receives time from *loss* 0. Then there are server’s *stratums* 2 to 15, which always they get the time from the parent server and their number basically shows distance from the reference clock.

The NTP algorithm begins by sending a defined packet (RFC 5905), respectively datagram, from client to server. The most important information transmitted by this packet are client mode (NTPv4), *stratum* local clock, accuracy of local clock, and especially the time **T1**, which indicates the time of the local clock at the time the packet leaves to networks. After the NTP server receives the packet, the server writes the time **T2** to it, which indicates the current time on the server clock and just before sending the time **T3**, which indicates the time the packet leaves back to the network. After receiving the packet by the client, it is finally writes the last time **T4**, which indicates the arrival back to the client. if they are these times are measured accurately, it is enough to calculate the two resulting ones thanks to the formulas below values. **Offset**, which symbolizes the shift of the client clock from the clock on the server and **Delay**, which represents the delay of the packet passing through the network, which can be due switches and network technologies are highly variable. The sum of these values then represents the final shift of the local clock, which should ideally be equal to zero.

[](https://raw.githubusercontent.com/parezj/NTP-Client/master/img/ntp_eq.png)