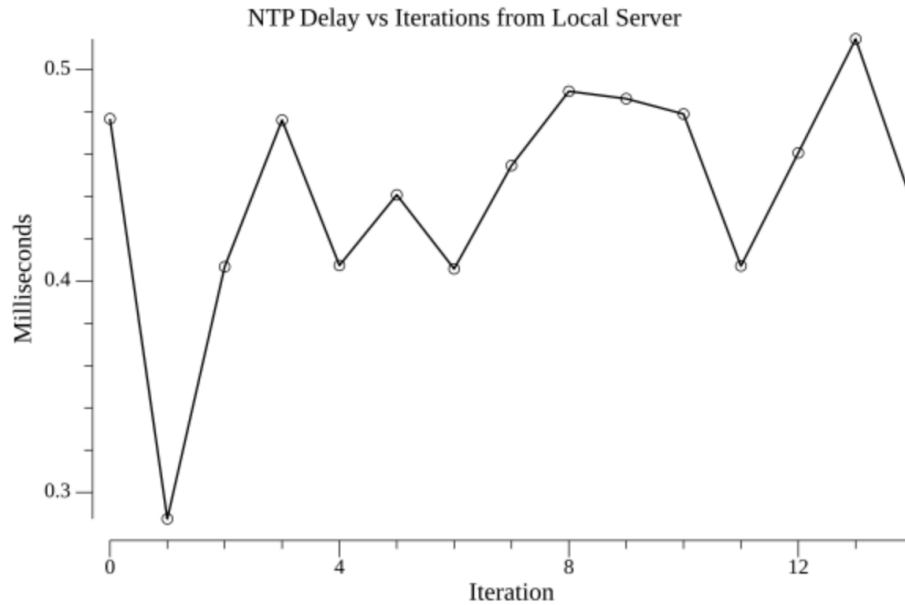
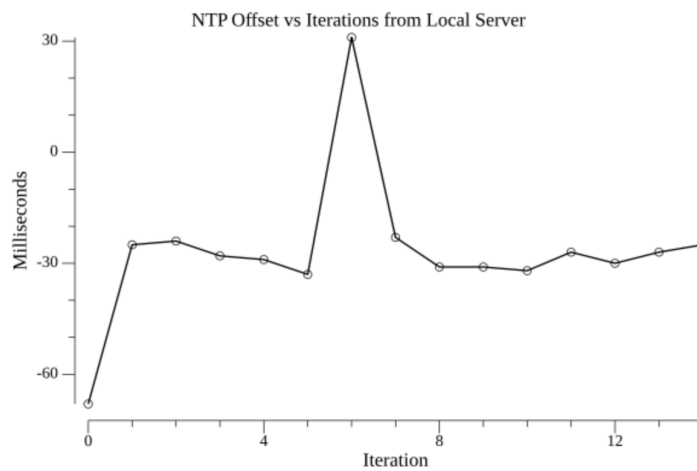


NTP Server Timings

1. Local Client and Server on the Same Network:

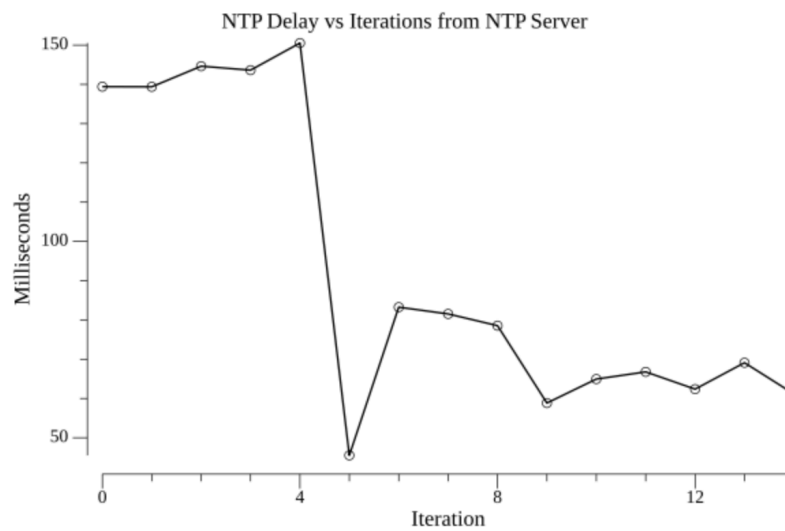


The delay is pretty less, around 0.4 ms as they are in the same network

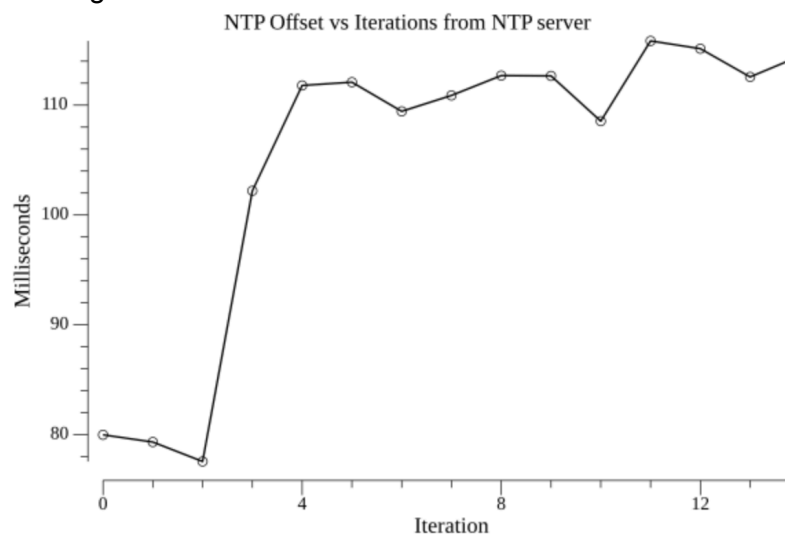


The offset was a bit high when they started maybe because these 2 systems are not synchronized. But as the iterations increased the offset reduced and even settled to a value after iterations.

2. Local Client and NTP Server:

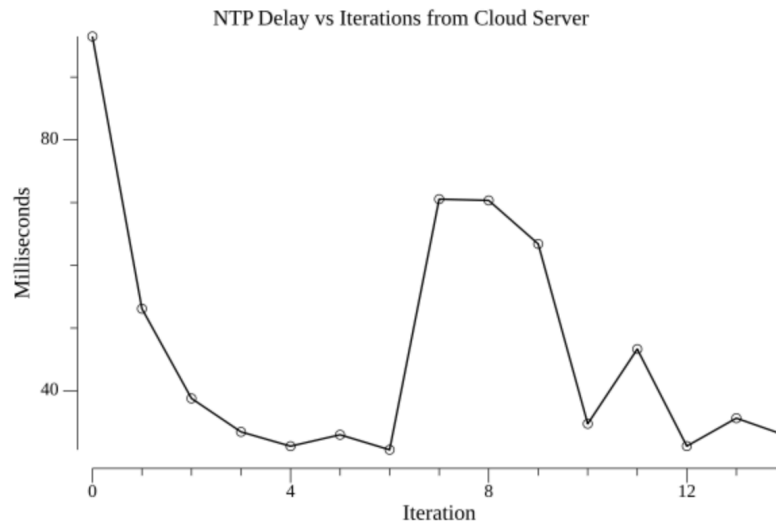


The delay is pretty high, the lowest value is 50ms compared to the 0.4 ms when running on the same network

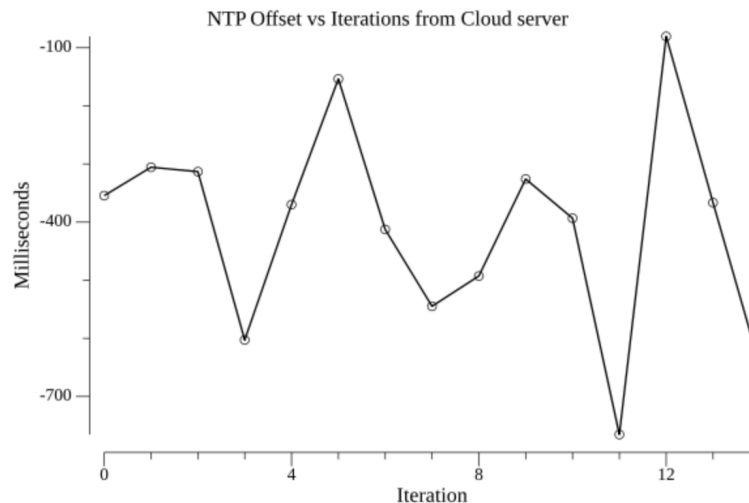


The offset is also pretty high compared to the local server case

3. Local Client and Cloud Server



The delay values are high compared to the Local server and not as high as the NTP Server



The offset values are too off. So, both the client and server might not be fully synchronized.

Conclusion:

From the above results, we can say that having both the server and client nearby reduced the delay and helped us achieve a stabilized offset compared to the scenario of the NTP server or cloud which has higher offsets and more varying.

Values:

1. Local Client and Server on the Same Network:

T1: 2024-03-08 19:43:24.598289 +0000 UTC T2: 2024-03-08 19:43:24 +0000 UTC
T3: 2024-03-08 19:43:24 +0000 UTC T4: 2024-03-08 19:43:24.598529 +0000 UTC
T1: 2024-03-08 19:43:26.600426 +0000 UTC T2: 2024-03-08 19:43:26 +0000 UTC
T3: 2024-03-08 19:43:26 +0000 UTC T4: 2024-03-08 19:43:26.600595 +0000 UTC
T1: 2024-03-08 19:43:28.602339 +0000 UTC T2: 2024-03-08 19:43:28 +0000 UTC
T3: 2024-03-08 19:43:28 +0000 UTC T4: 2024-03-08 19:43:28.602511 +0000 UTC
T1: 2024-03-08 19:43:30.604192 +0000 UTC T2: 2024-03-08 19:43:30 +0000 UTC
T3: 2024-03-08 19:43:30 +0000 UTC T4: 2024-03-08 19:43:30.604589 +0000 UTC
T1: 2024-03-08 19:43:32.61229 +0000 UTC T2: 2024-03-08 19:43:32 +0000 UTC
T3: 2024-03-08 19:43:32 +0000 UTC T4: 2024-03-08 19:43:32.612563 +0000 UTC
T1: 2024-03-08 19:44:34.014009 +0000 UTC T2: 2024-03-08 19:44:34 +0000 UTC
T3: 2024-03-08 19:44:34 +0000 UTC T4: 2024-03-08 19:44:34.014236 +0000 UTC
T1: 2024-03-08 19:44:36.015444 +0000 UTC T2: 2024-03-08 19:44:36 +0000 UTC
T3: 2024-03-08 19:44:36 +0000 UTC T4: 2024-03-08 19:44:36.01562 +0000 UTC
T1: 2024-03-08 19:44:38.017308 +0000 UTC T2: 2024-03-08 19:44:38 +0000 UTC
T3: 2024-03-08 19:44:38 +0000 UTC T4: 2024-03-08 19:44:38.017473 +0000 UTC
T1: 2024-03-08 19:44:40.019186 +0000 UTC T2: 2024-03-08 19:44:40 +0000 UTC
T3: 2024-03-08 19:44:40 +0000 UTC T4: 2024-03-08 19:44:40.019447 +0000 UTC
T1: 2024-03-08 19:44:42.021151 +0000 UTC T2: 2024-03-08 19:44:42 +0000 UTC
T3: 2024-03-08 19:44:42 +0000 UTC T4: 2024-03-08 19:44:42.021331 +0000 UTC
T1: 2024-03-08 19:45:44.008574 +0000 UTC T2: 2024-03-08 19:45:44 +0000 UTC
T3: 2024-03-08 19:45:44 +0000 UTC T4: 2024-03-08 19:45:44.008745 +0000 UTC
T1: 2024-03-08 19:45:46.010426 +0000 UTC T2: 2024-03-08 19:45:46 +0000 UTC
T3: 2024-03-08 19:45:46 +0000 UTC T4: 2024-03-08 19:45:46.010605 +0000 UTC
T1: 2024-03-08 19:45:48.012342 +0000 UTC T2: 2024-03-08 19:45:48 +0000 UTC
T3: 2024-03-08 19:45:48 +0000 UTC T4: 2024-03-08 19:45:48.012527 +0000 UTC
T1: 2024-03-08 19:45:50.014266 +0000 UTC T2: 2024-03-08 19:45:50 +0000 UTC
T3: 2024-03-08 19:45:50 +0000 UTC T4: 2024-03-08 19:45:50.014501 +0000 UTC
T1: 2024-03-08 19:45:52.015715 +0000 UTC T2: 2024-03-08 19:45:52 +0000 UTC
T3: 2024-03-08 19:45:52 +0000 UTC T4: 2024-03-08 19:45:52.015899 +0000 UTC
T1: 2024-03-08 19:46:54.022023 +0000 UTC T2: 2024-03-08 19:46:54 +0000 UTC
T3: 2024-03-08 19:46:54 +0000 UTC T4: 2024-03-08 19:46:54.023357 +0000 UTC
T1: 2024-03-08 19:46:56.027873 +0000 UTC T2: 2024-03-08 19:46:56 +0000 UTC
T3: 2024-03-08 19:46:56 +0000 UTC T4: 2024-03-08 19:46:56.028039 +0000 UTC
T1: 2024-03-08 19:46:58.032105 +0000 UTC T2: 2024-03-08 19:46:58 +0000 UTC
T3: 2024-03-08 19:46:58 +0000 UTC T4: 2024-03-08 19:46:58.032272 +0000 UTC
T1: 2024-03-08 19:47:00.036169 +0000 UTC T2: 2024-03-08 19:47:00 +0000 UTC
T3: 2024-03-08 19:47:00 +0000 UTC T4: 2024-03-08 19:47:00.036364 +0000 UTC
T1: 2024-03-08 19:47:02.039946 +0000 UTC T2: 2024-03-08 19:47:02 +0000 UTC
T3: 2024-03-08 19:47:02 +0000 UTC T4: 2024-03-08 19:47:02.040167 +0000 UTC
T1: 2024-03-08 19:48:04.026964 +0000 UTC T2: 2024-03-08 19:48:04 +0000 UTC
T3: 2024-03-08 19:48:04 +0000 UTC T4: 2024-03-08 19:48:04.027349 +0000 UTC
T1: 2024-03-08 19:48:06.029219 +0000 UTC T2: 2024-03-08 19:48:06 +0000 UTC
T3: 2024-03-08 19:48:06 +0000 UTC T4: 2024-03-08 19:48:06.029418 +0000 UTC
T1: 2024-03-08 19:48:08.030735 +0000 UTC T2: 2024-03-08 19:48:08 +0000 UTC
T3: 2024-03-08 19:48:08 +0000 UTC T4: 2024-03-08 19:48:08.03091 +0000 UTC
T1: 2024-03-08 19:48:10.031709 +0000 UTC T2: 2024-03-08 19:48:10 +0000 UTC
T3: 2024-03-08 19:48:10 +0000 UTC T4: 2024-03-08 19:48:10.031947 +0000 UTC

T1: 2024-03-08 19:48:12.033688 +0000 UTC T2: 2024-03-08 19:48:12 +0000 UTC
T3: 2024-03-08 19:48:12 +0000 UTC T4: 2024-03-08 19:48:12.033874 +0000 UTC
T1: 2024-03-08 19:49:14.007724 +0000 UTC T2: 2024-03-08 19:49:14 +0000 UTC
T3: 2024-03-08 19:49:14 +0000 UTC T4: 2024-03-08 19:49:14.0079 +0000 UTC
T1: 2024-03-08 19:49:16.009566 +0000 UTC T2: 2024-03-08 19:49:16 +0000 UTC
T3: 2024-03-08 19:49:16 +0000 UTC T4: 2024-03-08 19:49:16.009769 +0000 UTC
T1: 2024-03-08 19:49:18.011438 +0000 UTC T2: 2024-03-08 19:49:18 +0000 UTC
T3: 2024-03-08 19:49:18 +0000 UTC T4: 2024-03-08 19:49:18.011602 +0000 UTC
T1: 2024-03-08 19:49:20.012581 +0000 UTC T2: 2024-03-08 19:49:20 +0000 UTC
T3: 2024-03-08 19:49:20 +0000 UTC T4: 2024-03-08 19:49:20.012776 +0000 UTC
T1: 2024-03-08 19:49:22.013629 +0000 UTC T2: 2024-03-08 19:49:22 +0000 UTC
T3: 2024-03-08 19:49:22 +0000 UTC T4: 2024-03-08 19:49:22.013823 +0000 UTC

2. NTP Server:

T1: 2024-03-08 19:59:59.611889 +0000 UTC T2: 2024-03-08 19:59:59.732943753
+0000 UTC T3: 2024-03-08 19:59:59.732948501 +0000 UTC T4: 2024-03-08
19:59:59.676282 +0000 UTC
T1: 2024-03-08 20:00:01.678807 +0000 UTC T2: 2024-03-08 20:00:01.804086314
+0000 UTC T3: 2024-03-08 20:00:01.804091067 +0000 UTC T4: 2024-03-08
20:00:01.747196 +0000 UTC
T1: 2024-03-08 20:00:03.760157 +0000 UTC T2: 2024-03-08 20:00:03.887167111
+0000 UTC T3: 2024-03-08 20:00:03.887171932 +0000 UTC T4: 2024-03-08
20:00:03.832754 +0000 UTC
T1: 2024-03-08 20:00:05.835895 +0000 UTC T2: 2024-03-08 20:00:05.956796396
+0000 UTC T3: 2024-03-08 20:00:05.956801158 +0000 UTC T4: 2024-03-08
20:00:05.899856 +0000 UTC
T1: 2024-03-08 20:00:07.902808 +0000 UTC T2: 2024-03-08 20:00:08.024173218
+0000 UTC T3: 2024-03-08 20:00:08.024177975 +0000 UTC T4: 2024-03-08
20:00:07.973903 +0000 UTC
T1: 2024-03-08 20:01:09.985796 +0000 UTC T2: 2024-03-08 20:01:10.110857477
+0000 UTC T3: 2024-03-08 20:01:10.110862232 +0000 UTC T4: 2024-03-08
20:01:10.049874 +0000 UTC
T1: 2024-03-08 20:01:12.052305 +0000 UTC T2: 2024-03-08 20:01:12.177092993
+0000 UTC T3: 2024-03-08 20:01:12.17709775 +0000 UTC T4: 2024-03-08
20:01:12.115116 +0000 UTC
T1: 2024-03-08 20:01:14.11688 +0000 UTC T2: 2024-03-08 20:01:14.250615295
+0000 UTC T3: 2024-03-08 20:01:14.250620047 +0000 UTC T4: 2024-03-08
20:01:14.189399 +0000 UTC
T1: 2024-03-08 20:01:16.192986 +0000 UTC T2: 2024-03-08 20:01:16.317890137
+0000 UTC T3: 2024-03-08 20:01:16.317894951 +0000 UTC T4: 2024-03-08
20:01:16.257323 +0000 UTC
T1: 2024-03-08 20:01:18.258799 +0000 UTC T2: 2024-03-08 20:01:18.389745604
+0000 UTC T3: 2024-03-08 20:01:18.389750418 +0000 UTC T4: 2024-03-08
20:01:18.328443 +0000 UTC

T1: 2024-03-08 20:02:20.369477 +0000 UTC T2: 2024-03-08 20:02:20.478601
+0000 UTC T3: 2024-03-08 20:02:20.478685935 +0000 UTC T4: 2024-03-08
20:02:20.390834 +0000 UTC
T1: 2024-03-08 20:02:22.428318 +0000 UTC T2: 2024-03-08 20:02:22.540500999
+0000 UTC T3: 2024-03-08 20:02:22.540586498 +0000 UTC T4: 2024-03-08
20:02:22.452889 +0000 UTC
T1: 2024-03-08 20:02:24.455293 +0000 UTC T2: 2024-03-08 20:02:24.563718999
+0000 UTC T3: 2024-03-08 20:02:24.563819668 +0000 UTC T4: 2024-03-08
20:02:24.476093 +0000 UTC
T1: 2024-03-08 20:02:26.478423 +0000 UTC T2: 2024-03-08 20:02:26.58467 +0000
UTC T3: 2024-03-08 20:02:26.584784778 +0000 UTC T4: 2024-03-08
20:02:26.496845 +0000 UTC
T1: 2024-03-08 20:02:28.499146 +0000 UTC T2: 2024-03-08 20:02:28.608143999
+0000 UTC T3: 2024-03-08 20:02:28.608215183 +0000 UTC T4: 2024-03-08
20:02:28.520365 +0000 UTC
T1: 2024-03-08 20:03:30.555305 +0000 UTC T2: 2024-03-08 20:03:30.663066499
+0000 UTC T3: 2024-03-08 20:03:30.663068299 +0000 UTC T4: 2024-03-08
20:03:30.591576 +0000 UTC
T1: 2024-03-08 20:03:32.593925 +0000 UTC T2: 2024-03-08 20:03:32.736469199
+0000 UTC T3: 2024-03-08 20:03:32.736471599 +0000 UTC T4: 2024-03-08
20:03:32.66447 +0000 UTC
T1: 2024-03-08 20:03:34.666486 +0000 UTC T2: 2024-03-08 20:03:34.785860699
+0000 UTC T3: 2024-03-08 20:03:34.785862399 +0000 UTC T4: 2024-03-08
20:03:34.71488 +0000 UTC
T1: 2024-03-08 20:03:36.716561 +0000 UTC T2: 2024-03-08 20:03:36.835914299
+0000 UTC T3: 2024-03-08 20:03:36.835915899 +0000 UTC T4: 2024-03-08
20:03:36.762802 +0000 UTC
T1: 2024-03-08 20:03:38.764547 +0000 UTC T2: 2024-03-08 20:03:38.883413499
+0000 UTC T3: 2024-03-08 20:03:38.883416499 +0000 UTC T4: 2024-03-08
20:03:38.81009 +0000 UTC
T1: 2024-03-08 20:04:40.84438 +0000 UTC T2: 2024-03-08 20:04:40.955963499
+0000 UTC T3: 2024-03-08 20:04:40.955967199 +0000 UTC T4: 2024-03-08
20:04:40.879809 +0000 UTC
T1: 2024-03-08 20:04:42.884143 +0000 UTC T2: 2024-03-08 20:04:42.996248699
+0000 UTC T3: 2024-03-08 20:04:42.996250099 +0000 UTC T4: 2024-03-08
20:04:42.926338 +0000 UTC
T1: 2024-03-08 20:04:44.928751 +0000 UTC T2: 2024-03-08 20:04:45.047706299
+0000 UTC T3: 2024-03-08 20:04:45.047708999 +0000 UTC T4: 2024-03-08
20:04:44.971436 +0000 UTC
T1: 2024-03-08 20:04:46.97374 +0000 UTC T2: 2024-03-08 20:04:47.086900199
+0000 UTC T3: 2024-03-08 20:04:47.086902199 +0000 UTC T4: 2024-03-08
20:04:47.010343 +0000 UTC
T1: 2024-03-08 20:04:49.014413 +0000 UTC T2: 2024-03-08 20:04:49.126590999
+0000 UTC T3: 2024-03-08 20:04:49.126592999 +0000 UTC T4: 2024-03-08
20:04:49.049744 +0000 UTC
T1: 2024-03-08 20:05:51.054861 +0000 UTC T2: 2024-03-08 20:05:51.177809699
+0000 UTC T3: 2024-03-08 20:05:51.177811299 +0000 UTC T4: 2024-03-08
20:05:51.097285 +0000 UTC

T1: 2024-03-08 20:05:53.099148 +0000 UTC T2: 2024-03-08 20:05:53.222534899 +0000 UTC T3: 2024-03-08 20:05:53.222536499 +0000 UTC T4: 2024-03-08 20:05:53.143496 +0000 UTC
T1: 2024-03-08 20:05:55.145938 +0000 UTC T2: 2024-03-08 20:05:55.268511299 +0000 UTC T3: 2024-03-08 20:05:55.268515099 +0000 UTC T4: 2024-03-08 20:05:55.188774 +0000 UTC
T1: 2024-03-08 20:05:57.191088 +0000 UTC T2: 2024-03-08 20:05:57.308463699 +0000 UTC T3: 2024-03-08 20:05:57.308465199 +0000 UTC T4: 2024-03-08 20:05:57.229074 +0000 UTC
T1: 2024-03-08 20:05:59.231387 +0000 UTC T2: 2024-03-08 20:05:59.355266699 +0000 UTC T3: 2024-03-08 20:05:59.355268199 +0000 UTC T4: 2024-03-08 20:05:59.275665 +0000 UTC

3. Cloud Server:

- T1: 2024-03-09 05:22:33.078646 +0000 UTC T2: 2024-03-09 05:22:33.22120467 +0000 UTC T3: 2024-03-09 05:22:33.221654897 +0000 UTC T4: 2024-03-09 05:22:33.128706 +0000 UTC
4. T1: 2024-03-09 05:22:35.132113 +0000 UTC T2: 2024-03-09 05:22:35.278266147 +0000 UTC T3: 2024-03-09 05:22:35.278374811 +0000 UTC T4: 2024-03-09 05:22:35.204662 +0000 UTC
5. T1: 2024-03-09 05:22:37.20884 +0000 UTC T2: 2024-03-09 05:22:37.349025173 +0000 UTC T3: 2024-03-09 05:22:37.349242367 +0000 UTC T4: 2024-03-09 05:22:37.254794 +0000 UTC
6. Timeout occurred on attempt 1, retrying...
7. T1: 2024-03-09 05:22:44.272142 +0000 UTC T2: 2024-03-09 05:22:44.4114655 +0000 UTC T3: 2024-03-09 05:22:44.411756999 +0000 UTC T4: 2024-03-09 05:22:44.316353 +0000 UTC
8. Timeout occurred on attempt 1, retrying...
9. T1: 2024-03-09 05:22:51.324388 +0000 UTC T2: 2024-03-09 05:22:51.465444862 +0000 UTC T3: 2024-03-09 05:22:51.465469528 +0000 UTC T4: 2024-03-09 05:22:51.371117 +0000 UTC
10. T1: 2024-03-09 05:22:53.37543 +0000 UTC T2: 2024-03-09 05:22:53.51466418 +0000 UTC T3: 2024-03-09 05:22:53.514829869 +0000 UTC T4: 2024-03-09 05:22:53.420415 +0000 UTC
11. T1: 2024-03-09 05:22:55.423977 +0000 UTC T2: 2024-03-09 05:22:55.560927923 +0000 UTC T3: 2024-03-09 05:22:55.560951697 +0000 UTC T4: 2024-03-09 05:22:55.465575 +0000 UTC
12. T1: 2024-03-09 05:22:57.468915 +0000 UTC T2: 2024-03-09 05:22:57.608886308 +0000 UTC T3: 2024-03-09 05:22:57.608922258 +0000 UTC T4: 2024-03-09 05:22:
- 13.