

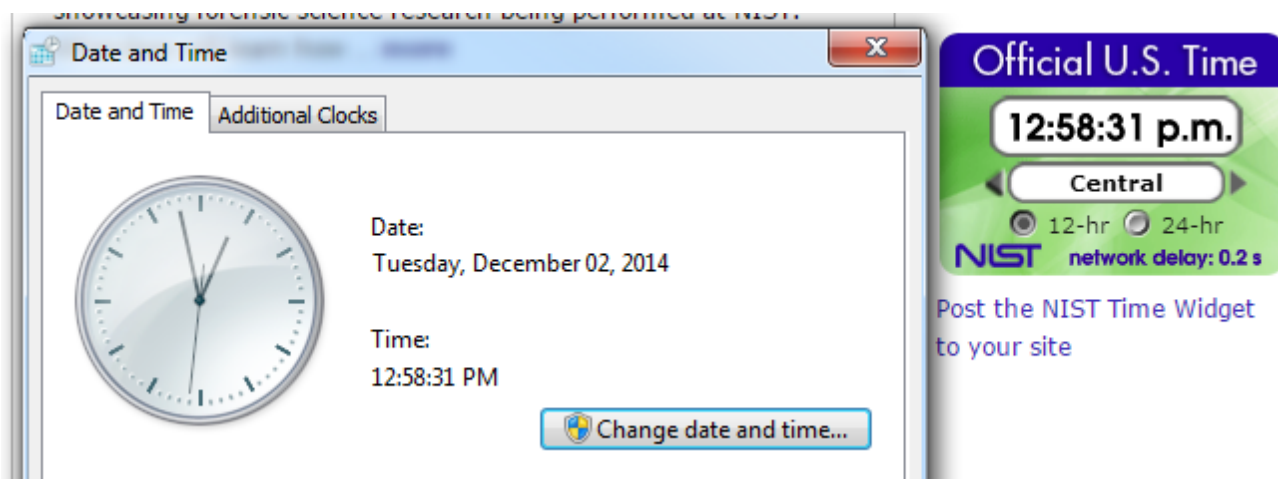
Marcia E. Asquith
Office of the Corporate Secretary
FINRA

Ms. Asquith:

FINRA is requesting comment on all aspects of the subject proposed requirement, including the incremental costs of complying with a synchronization standard of 50 milliseconds versus a standard of 100 or 200 milliseconds for computer system clocks.

FINRA's questions have been re-printed below followed by comments from Crews for FINRA's consideration:

- Does your firm currently synchronize its computer clocks to within less than a second of the NIST (*e.g.*, to within 50 or 100 milliseconds), and if so, what are the costs associated with maintaining that standard?
Comment: Yes. We typically are synchronized within less than 1 second; however, the entire industry is limited to the time it takes for the roundtrip time sync request to receive updated time from NIST. That round trip time is variable depending on which server time.nist.gov routes each user to and the multitude of possible internet routes the data packet can travel. All of this is out of the participant's control. Once we obtain the packet we can typically update the time on all our systems within 50ms about 90% of the time. The network delay between each industry participant and NIST can be 200ms or more as seen by this image.



- What, if any, systems changes would firms need to make for purposes of complying with a reduction in the allowable drift tolerance for computer system clocks? What are the anticipated costs associated with these system changes?
Comment: Given the majority of the delay in receiving the data from NIST and not our ability to update internal systems, there is really no system changes our firm can make. The network delay results are determined from how far our internet connection is from the NIST core internet backbone, which cannot be changed without physically relocating our firm's center of operations.
- FINRA understands that there may be off-the-shelf software products generally available that could help firms achieve a 100 millisecond, and possibly a 50 millisecond, drift standard. What would the costs be, including systems and labor costs, of using such software? What are the benefits and drawbacks of using these types of products?

Comment: We can achieve internal synchronization to the new standard with our current systems, but there is no off-the-shelf system that can obtain the time packet from a NIST server to our firm any faster than we are receiving the packets now. That packet delay is a function of how far away the participants are from NIST servers (as the data packet travels) and how many routers and switches it must traverse to arrive to us.

- Would the necessary systems changes and the associated costs vary depending on whether the synchronization standard is 50 milliseconds versus either 100 or 200 milliseconds?
Comment: It is extremely unlikely any system change, no matter how expensive, would allow us to remain synchronized to NIST time with less than 200 ms of drift.
- Would the proposed adoption of a 50 milliseconds standard cause any residual or other “downstream” impacts on a firm’s systems? If so, would those impacts be mitigated if FINRA adopted a 100 or 200 millisecond standard instead?
Comment: It is extremely unlikely any system change, no matter how expensive, would allow us to remain synchronized to NIST time with less than 200 ms of drift
- How much time would firms need to make any necessary systems changes to comply with a 50 millisecond standard?
Comment: We cannot achieve a 50ms minimum drift for the reasons stated above.
- Would the implementation timeframe change materially under a higher (*e.g.*, 100 or 200 millisecond) standard?
Comment: No.
- If FINRA adopts a 50 millisecond standard, should a separate more permissive standard apply to firms with a de minimis amount of order and trading activity that are not engaged in algorithmic or high frequency trading, and if so, what should that standard be? How should FINRA define the universe of firms to which such a separate standard would apply?
Comment: A separate rule for HFTs would be advisable. We do not engage in such activities and can easily accommodate the current 1s rule.
- What would be the impact of a 50 millisecond standard on smaller firms? Would the impact change materially under a 100 or 200 millisecond standard?
Comment: See above.
- If smaller firms had a longer implementation period, would this lessen the impact on these firms of complying with a 50 millisecond standard? How should FINRA define the universe of firms to which such a separate standard would apply? What would be the impact of a 50 millisecond standard on firms that use their clearing firm’s system for order routing and execution and regulatory reporting?
Comment: Given the orders are initiated at our firm, requiring the clearing firm to achieve less than 50ms drift for our trades but our inability to achieve the same may result in auditor confusion. Auditing rules should make it clear that comparisons of cleared trade timestamps and order timestamps should use the current 1s rule for firms that don’t engage in HFTs.
- As noted above, the synchronization standard for the CAT may be 50 milliseconds. Do firms have concerns about making systems changes in the near-term to comply with a higher drift tolerance under FINRA rules, *e.g.*, 100 milliseconds, given that they may have to comply with a 50 millisecond standard under CAT in the longer term?
Comment: Given the orders are initiated at our firm, requiring the clearing firm to achieve less than 50ms drift for our trades but our inability to achieve the same may result in auditor confusion. Auditing rules should make it clear that comparisons of cleared trade timestamps and order timestamps should use the current 1s rule for firms that don’t engage in HFTs.
- Should the one second requirement for manual clocks remain? If not, what is an appropriate standard for manual clocks?
Comment: Yes

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