

Standards for time sync & event capture (and a bit about MiFID 2)

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What's not new

- The need for highly accurate timestamps
- Capturing events in applications
- Capturing events on the wire

What is new

- ULL trading requirements reaching a level where finer differences matter
 - Cannot just assume that hardware timestamping is “accurate enough”
- Regulations are requiring “accurate” timestamps
 - FINRA 14-47 / CAT / OATS
 - MiFID 2
- Requirement to evidence the accuracy via system design

The US requirement

- Granularity: 1 millisecond
- Accuracy: Within 50 milliseconds of NIST
- Requirement reviewed annually
 - By Chief Compliance Officer of NMS Plan Processor
 - Key consideration: state of technology in the industry
- Compliance documented via procedures and sync logs
- Our guess:
 - US regulators may further differentiate requirements by trading activity. They already exempt manual trading.
 - They will see how it goes with MiFID 2 first.

What is MiFID 2 time sync?

- Overhaul of markets regulation
 - Expand coverage, increase transparency, central clearing, accountability, resilience of markets
 - “Clamp down on” “HFT” and abuse/manipulation
- Goes into effect at start of 2018
- May apply to US firms with servers in European colo
 - Decision sitting with European Parliament
- Mandates accuracy and granularity of timestamps on certain trading events on European markets
 - Trading firms and trading venues
 - Requires firms to prove the traceability of those timestamps to UTC by documenting their system design
 - Also requires impossible-to-satisfy sequence numbering

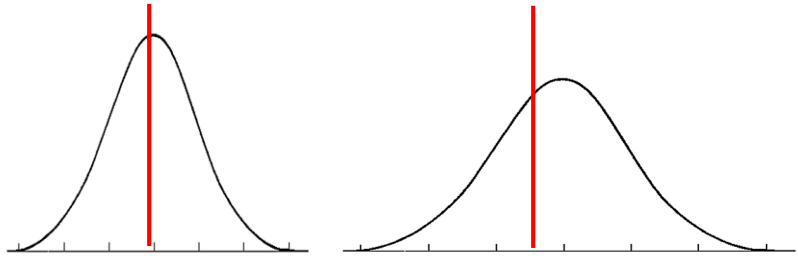
Investment firm requirements

<i>Type of trading activity</i>	<i>Description</i>	<i>Max. divergence from UTC</i>	<i>Timestamp granularity</i>
Activity using high frequency algorithmic trading technique	High frequency algorithmic trading technique	100 microseconds	1 microsecond or better
Activity on voice trading systems	Voice trading systems as defined in Article 1(7) of RTS transparency requirements in respects of bonds, structured financial products etc.	1 second	1 second
Activity on request for quote systems where the response requires human intervention or where the system does not allow algorithmic trading		1 second	1 second
Activity of concluding negotiated transactions		1 second	1 second
Any other trading activity		1 millisecond	1 millisecond

What this means for pure-play HFT firms

- Most already have timestamps better than +/- 100 μ sec
- Most not sure what evidence regulators want for traceability
- Need to bear in mind it's not just the regs that matter
 - “Brother’s keeper” ethos in compliance
 - Burden of proof in market abuse investigations
- These have implications for what you capture, how much accuracy you want, and what kind of traceability you prove

“Traceability is more involved than we thought”

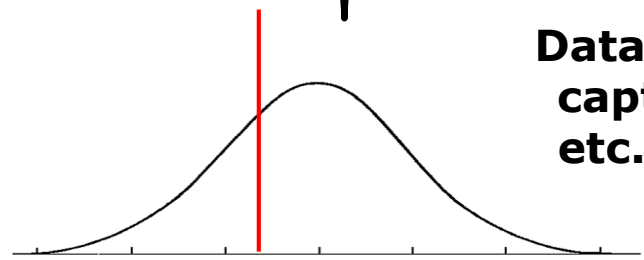


Need traceability for every timestamp



UTC

Timestamping point



Data model must cover events, capture points, time sources, etc. over full system lifecycle



The three phases of traceability

We argue that the requirements imply a need for traceability information at three stages

**Before
deployment**

Use information about component-level traceability as a critical input to solution design

**At
deployment**

Prove the traceability of what you've just deployed

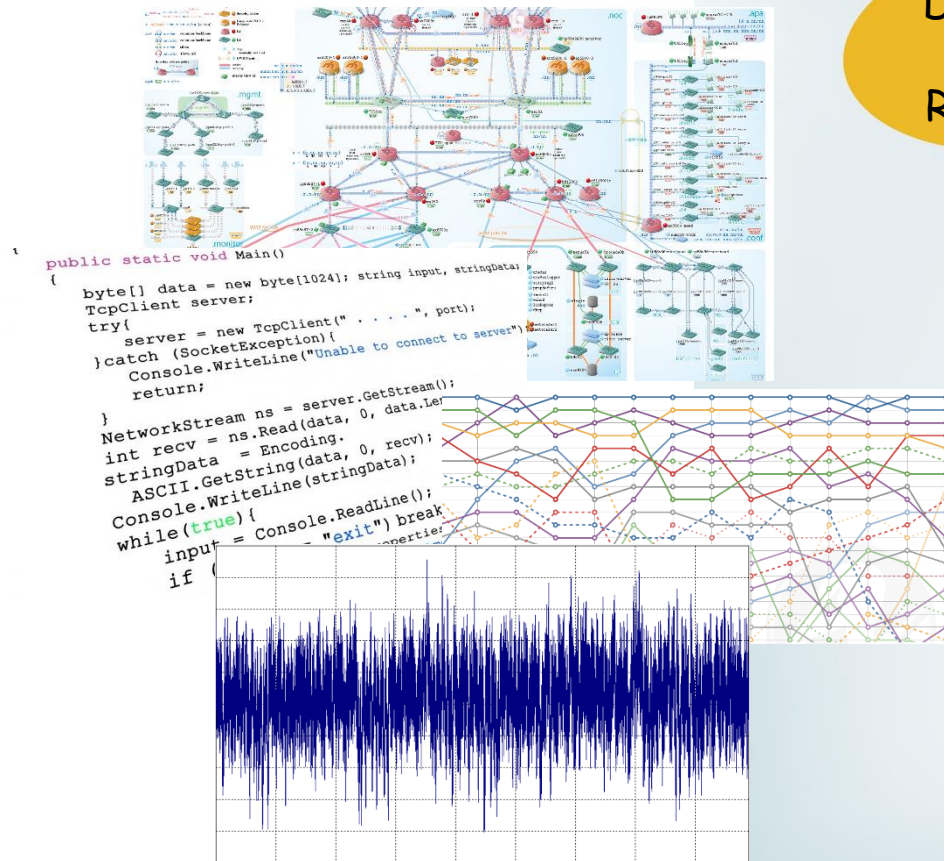
**After deployment
(on-going)**

Monitor component-level and end-to-end traceability

Consider just traceability-based design

Standards of evidence

Are regulators going to inspect your technical implementation?



"Did you use RTSC or RDTSCP?"



Standards of evidence

- Of course not.
- They will hire consultants (at your expense).
- Or ask for independent certifications.
- In both cases:

Standards will be key

That's what STAC-TS is about

- STAC-TS Working Group
 - Experts from user firms and vendor firms
- Defining evidence standards for traceability
 - Time references
 - Time synchronisation
 - Wire capture
 - Application timestamping
- Not limited to MiFID 2 requirements
 - Standards will be useful for ULL requirements, too
- Logistics/timeline
 - First standards in trial this summer
 - Weekly telecons, in-person meeting last week
 - Invitation only. Interested? Contact us.