Assisting Regulatory Compliance in Time Synchronization for Finance

FSMLabs Inc.

TimeKeeper.

www.fsmlabs.com

MiFID II in the EU and FINRA/CATS in USA require clock sync in financial trading firms

- The requirement involves a lot of "documentation"
- This puts clock sync records in the same basket as other trading records.

MiFIdII

MiFID II/MiFIR

"Operators of trading venues and their members or participants shall be able to evidence that their systems meet the requirements. They shall be able to do so by documenting the system design, it's functioning and specifications."

One underlying purpose is to document books are not being manipulated.

- Is the order flow consistent with market regulations? (need consistent timestamps to determine sequence of events)

- Are trades anticipating release of supposedly confidential data?

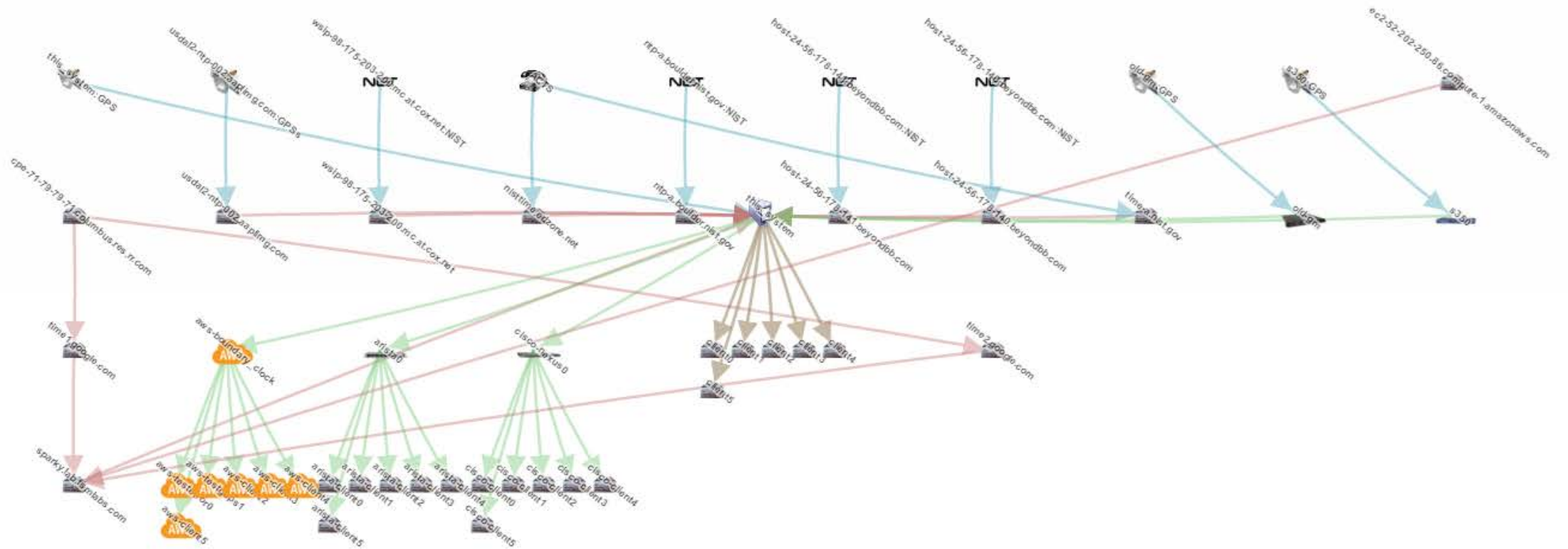- Are risk limits being always enforced?

- …

When transactions are 50 microseconds, then timestamps are essential for data integrity
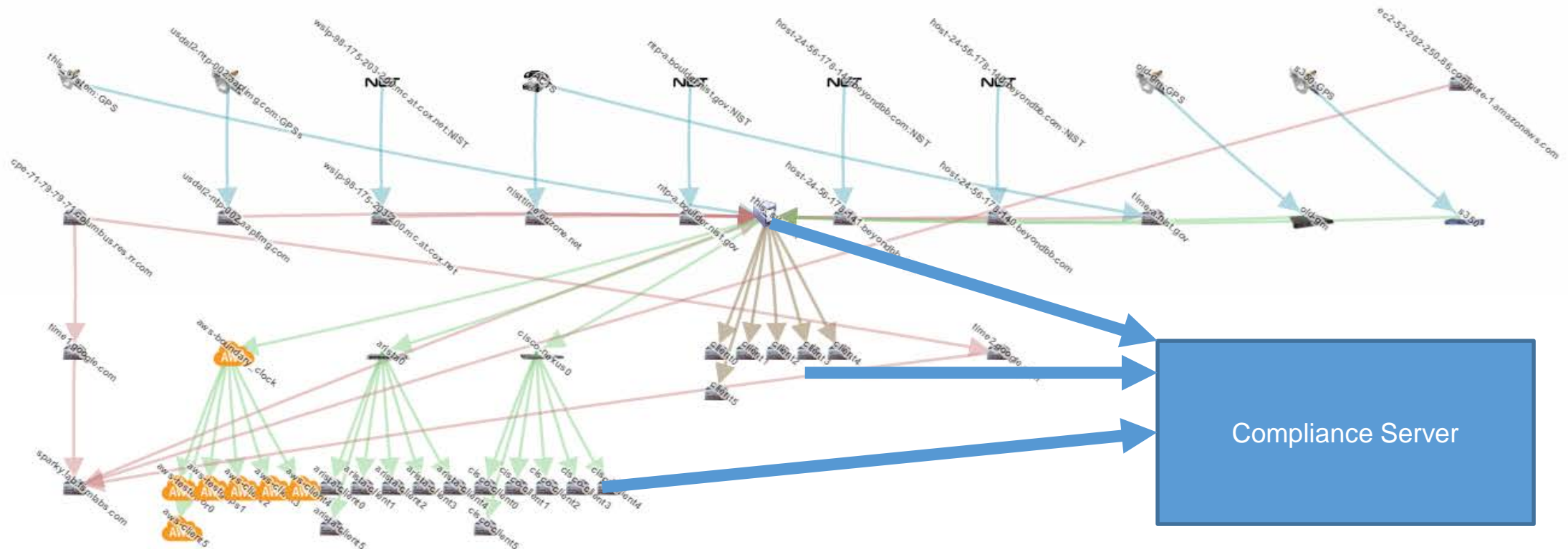
Monitoring multiple time sources is essential if the reference time can fail.
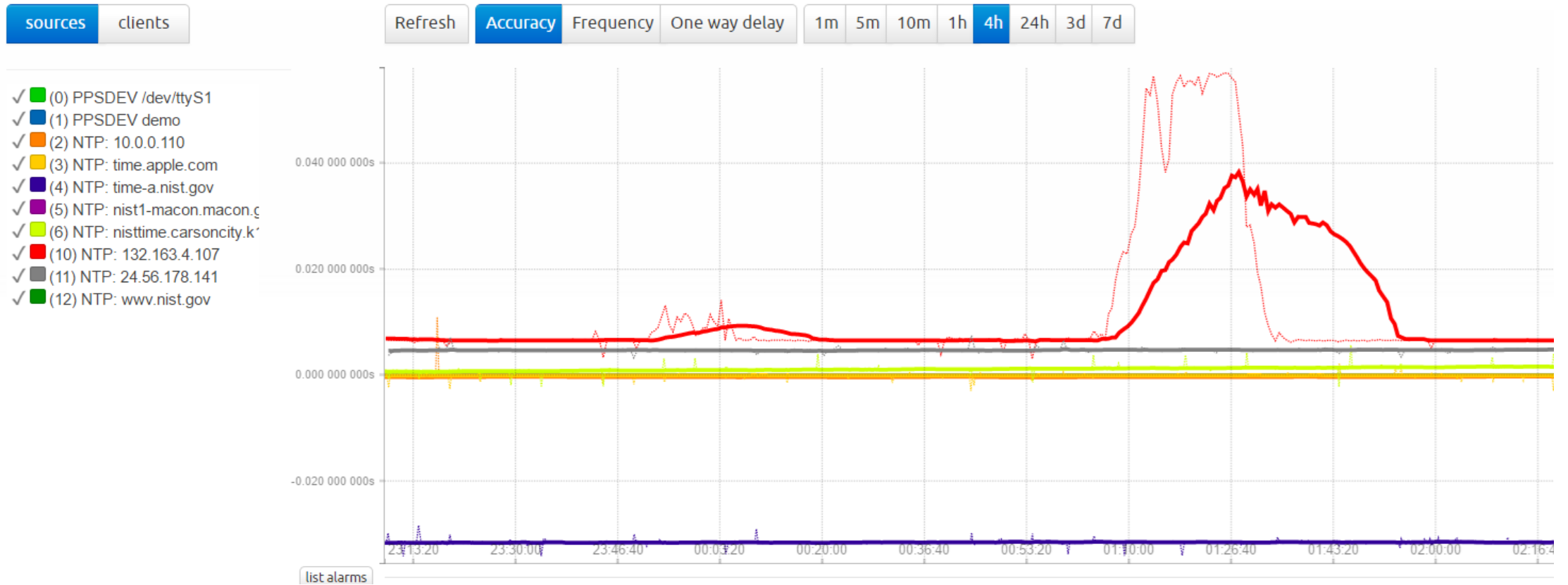
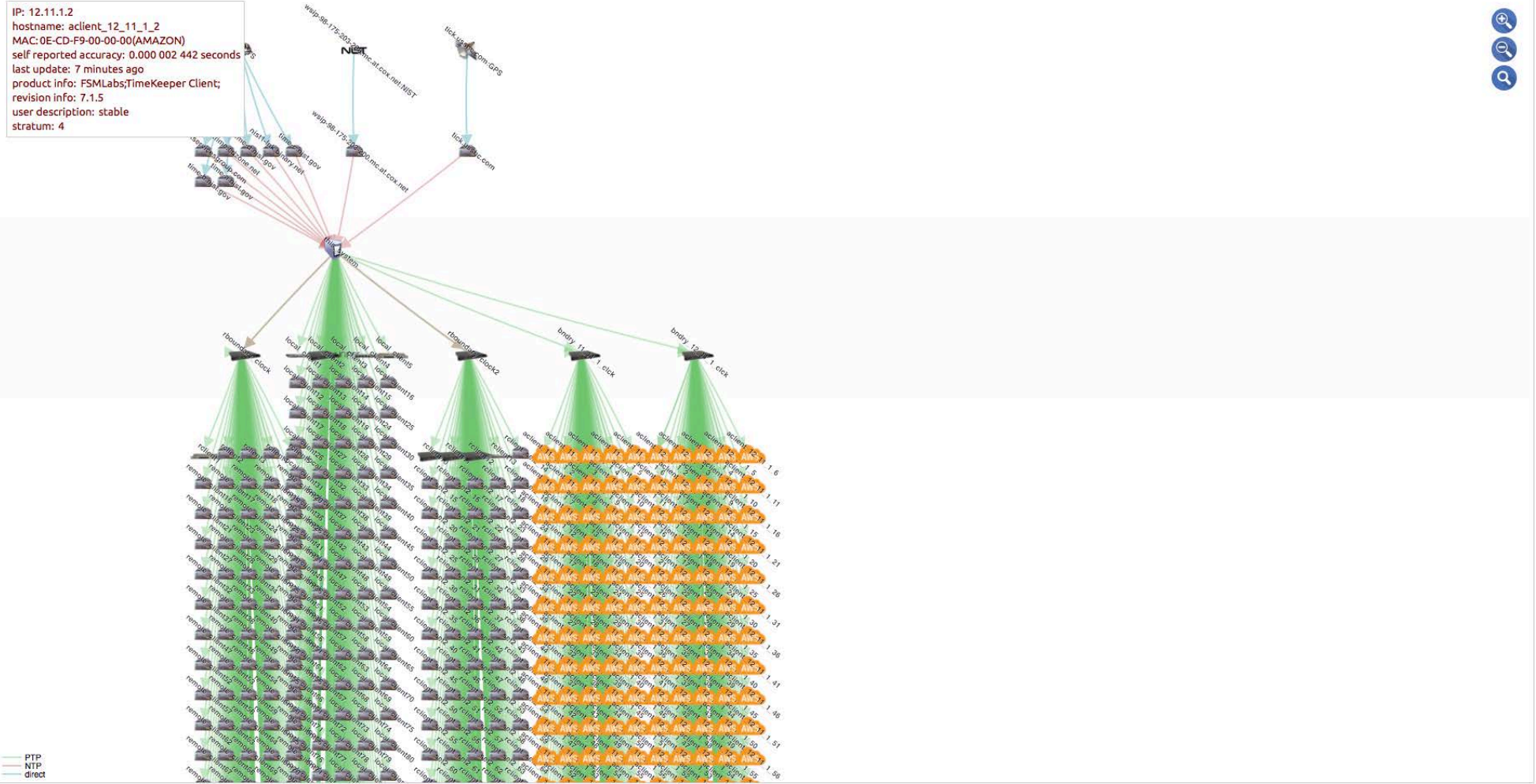# Goal is to show a chain of evidence from client to source.

Compliance servers should be able to collect data from all participants in clock sync
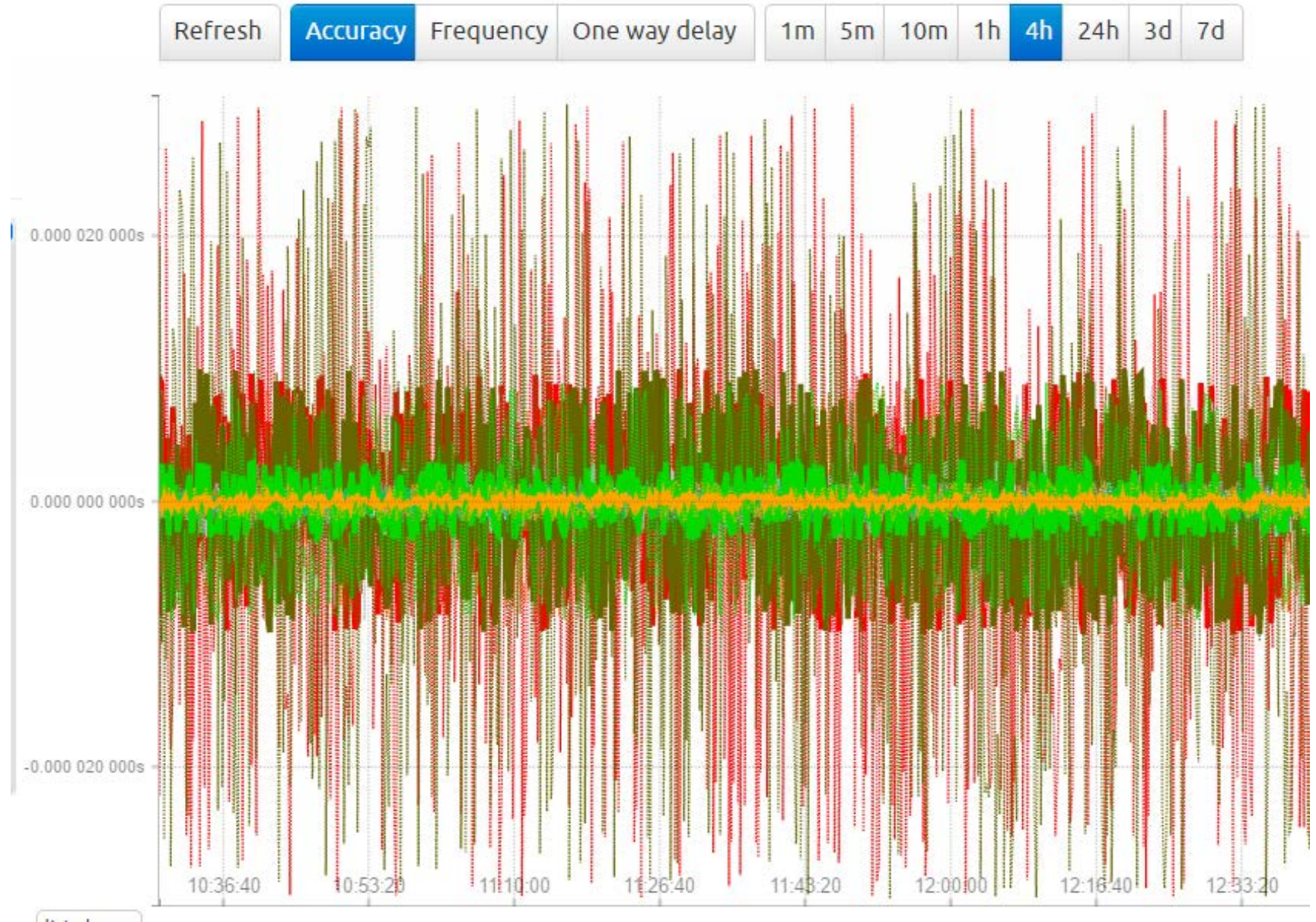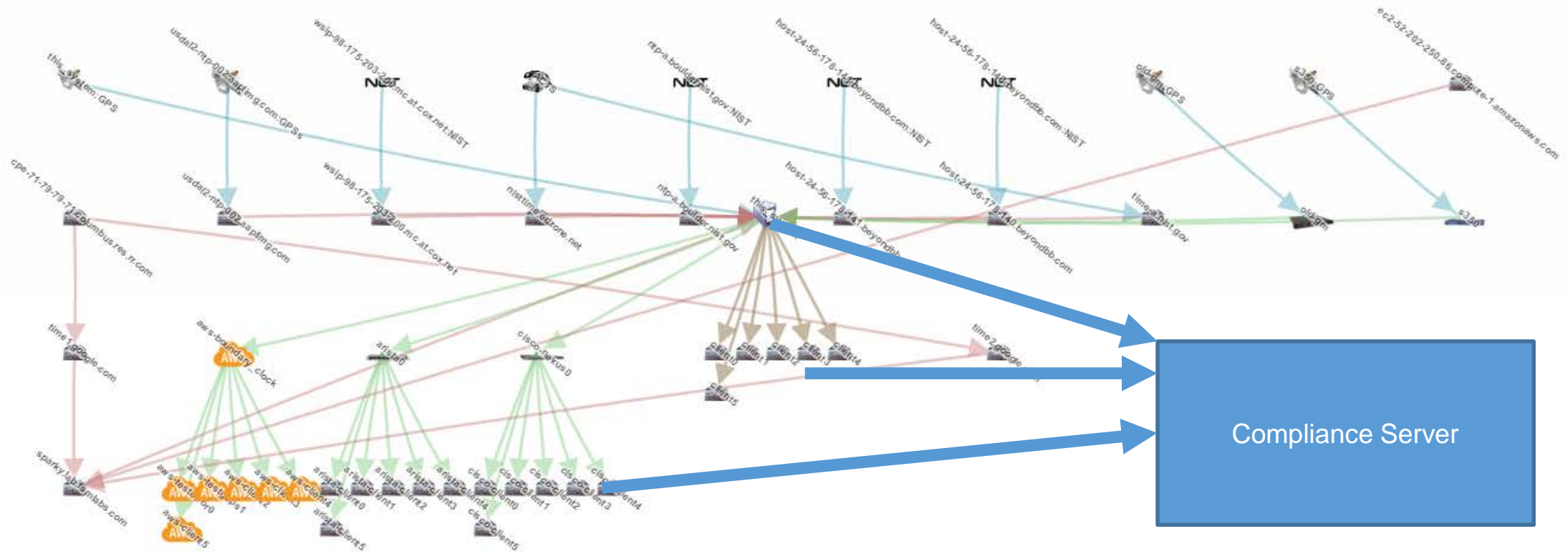
More realistic map
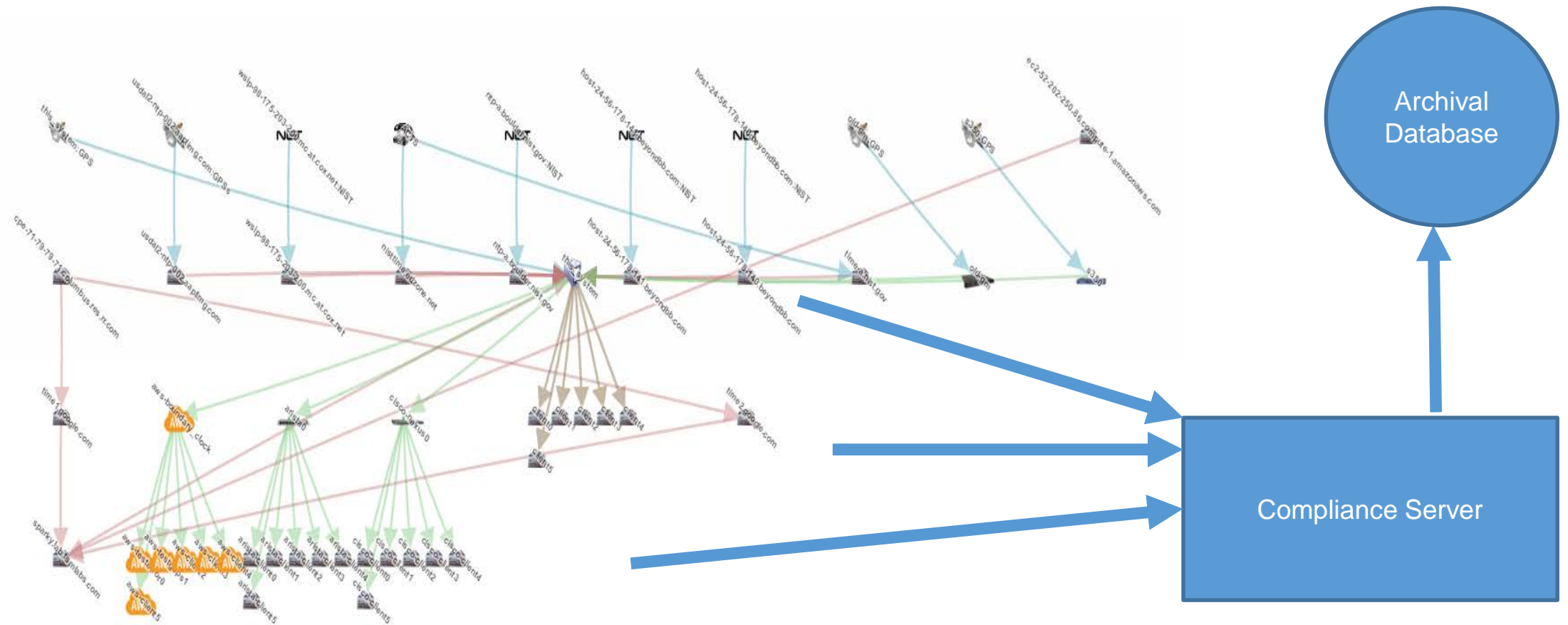
The server monitors its clients

Without the outlier – most look good.

Goal is to show a chain of evidence from client to source.

Compliance Servers also need to build a searchable archival database

The clock data is presented in a form to flag compliance and failure

Reporting has to be able to filter on different sets of machines; tolerances; and dates.

A report, a range, a tolerance, and a tolerance

Drill down to specific machine (IP number)

10.0.0.147	0.056 631 078	2	0h 12m 43s	3515

Source	Max Offset	Samples	Sample From
Source 0	0.056 631 078	3,515	undefined

Alerts, Warnings & Gaps

Bucket	Start	End	Duration
0.050000000	1478605508.621463299	1478606108.176355839	599.554892540
GAP	1478623886.773636341	1478624624.595240116	737.821603775
GAP	1478635254.819823265	1478636018.757485867	763.937662601

A report summary

Synchronization Report for 2015-01-01 to 2017-03-13

Report Start: Thu, 01 Jan 2015 00:00:00 GMT
Report End: Mon, 13 Mar 2017 00:00:00 GMT
Clientset: ALL
Warning Threshold: 0.001
Alert Threshold: 0.05

Clients by maximum offset range

Sync'd   Warning   Alert

141

39

22
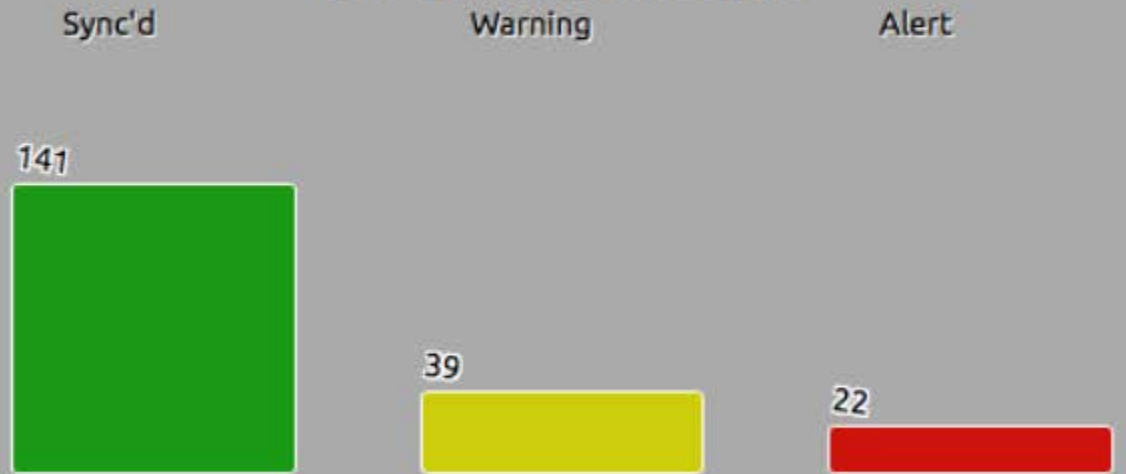
A daily report

IP Address	Max Offset	YYYY-MM-DD
192.168.1.16	0.086 436 813	2015-01-05
10.0.0.11	0.054 932 932	2015-01-05
10.0.0.197	0.087 477 597	2015-01-05
10.0.0.196	0.094 905 984	2015-01-05
10.0.0.92	0.001 843 796	2015-01-05
10.0.0.160	0.000 927 441	2015-01-05

MiFID II imposes a requirement to store significant amounts of data

- Rough order of magnitude is 1 terabyte of data per year per 1000 clients (more with more sources)

- Data needs to be searchable

- Data needs to be checksummed and validated

- Each financial institution and each regulatory framework involves different reporting forms and requirements (which are evolving)

- Regular automatic report generation and "real-time" data query are both necessary functions.

Contact info

FSMLabs, Inc.
11701 Bee Caves Road, Suite 200
Austin, TX 78738
USA
info@fsmlabs.com

Telephone: 1-512-263-5530