

NYC 1/23/2018 ATIS Time&Money

## TimeKeeper Compliance: current and future



# TIMEKEEPER IS SUITE OF PROGRAMS FOR END TO END CLOCK SYNC AND MANAGEMENT OF CLOCKS

- **TimeKeeper Client:**
  - Synchronizes time (PTP/NTP),
  - Analytics, reporting, GUI, alerting
  - Failover/fault-tolerance, logging/distribution
- **TimeKeeper Server** adds
  - GPS/Galileo/GNSS receivers,
  - GM/BoundaryClock/Stratum Server
  - Monitor/Alert/analyze clock distribution
- **TimeKeeper Compliance** adds
  - Reporting and database queries to assist in regulatory compliance and data governance.



1934 Gerald Sargent Foster, Racing, 1934

# TK COMPLIANCE: REPORTING AND ALERTING

[Download daily audit 'Compliance global report' for 2017-01-02](#)

## Synchronization report for 2017-01-02

Report start:	Mon, 02 Jan 2017 00:00:00 GMT (1483315200)
Report end:	Tue, 03 Jan 2017 00:00:00 GMT (1483401600)
Report title:	Compliance global report
Report type:	daily
Client set:	*
Min gap length:	180(s)
Warning threshold:	0.001 000 000
Min warning length:	0(s)
Time > warning:	<b>1.83% client/source time in warning</b>
Alert threshold:	0.050 000 000
Min alert length:	0(s)
Time > alert:	0.00% client/source time out of compliance

## Clients/sources by maximum offset range

Synchronized      Warning      Alert

1906 (80.02%)



476 (19.98%)



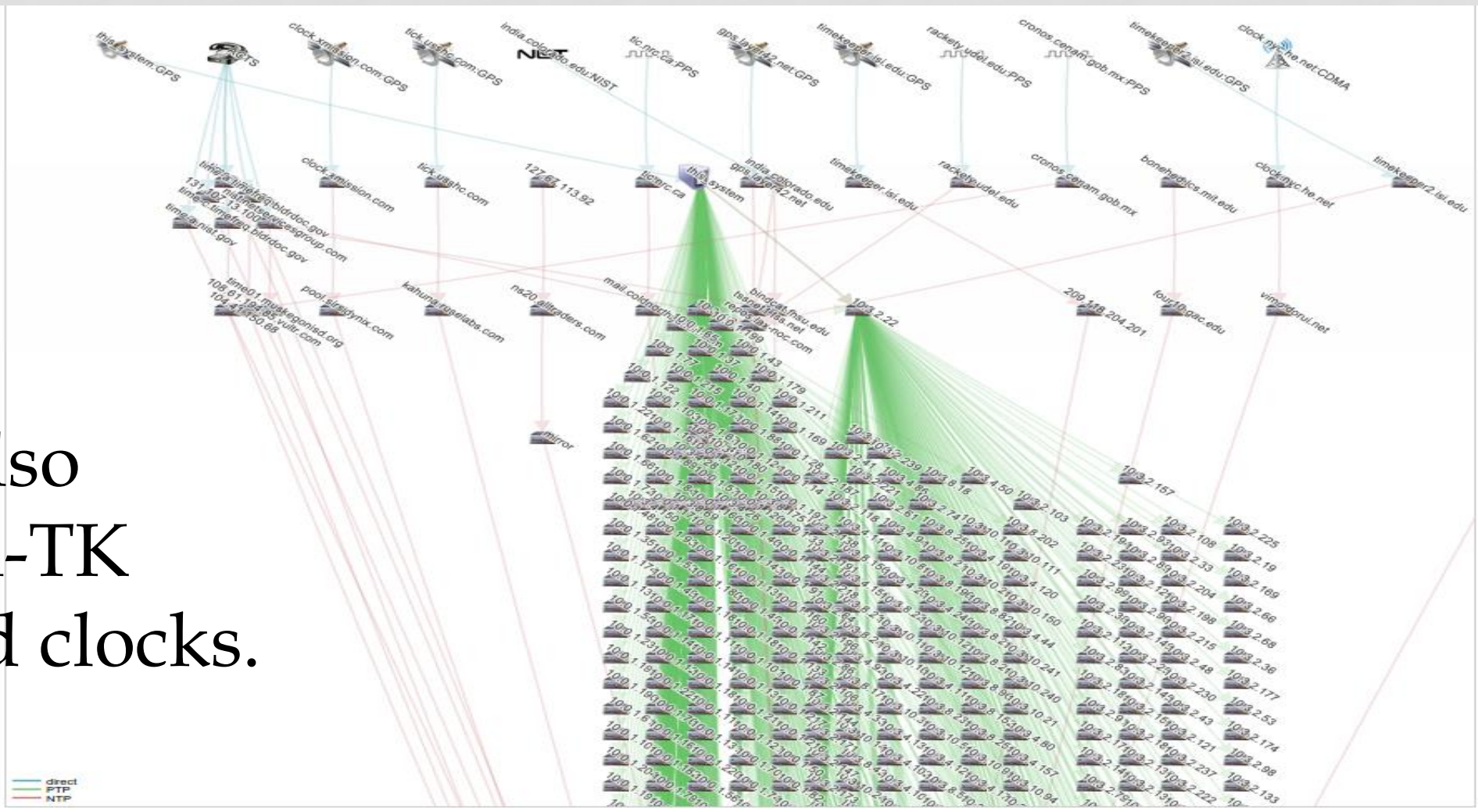
0 (0.00%)



# TIMEKEEPER COMPLIANCE IN PRODUCTION SINCE 2016

- Creates a searchable database
- Generates reports
- Provides archival storage
- Documents traceability and compliance
- Standard PTP protocols
- Compatible with the whole TimeKeeper suite and other clock sync products.

# COMPLIANCE BUILDS ON THE DATA GATHERING AND ANALYTICS CAPABILITIES OF TK-CLIENT/SERVER



But can also query non-TK clients and clocks.

# STABLE AND RELIABLE IN WIDE USE

- Multiple Tier1 banks
- Other large scale financial trading firms.
- Smaller shops that need MiFID2
- Anyone with strong governance requirements.

IP Address	Max Offset	Gaps	Max Gap
192.168.1.71	1.277 241 854	3	6h 32m 30s

Source	Max Offset	Samples	Sample From
Source 0	1.277 151 460	33,938	PTP(192.168.1.155:0)

Alerts, Warnings & Gaps			
Issue	Start	End	Duration
Gap	1515715200.000000000	1515727377.405415297	12177.405415297
Alert > 0.050000000	1515727377.405415297	1515727774.845228672	397.439813375
Warning > 0.001000000	1515727377.405415297	1515727905.922057629	528.516642332
Warning > 0.001000000	1515727913.958230257	1515727916.243117809	2.284887552
Gap	1515739680.729933262	1515751643.809234858	11963.079301596
Alert > 0.050000000	1515751643.809234858	1515751877.441401243	233.632166385
Warning > 0.001000000	1515751643.809234858	1515752060.709804773	416.900569915
Gap	1515775714.889776468	1515799266.478094578	23551.588318110
Alert > 0.050000000	1515799266.478094578	1515799544.799323320	278.321228742
Warning > 0.001000000	1515799266.478094578	1515799722.255388498	455.777293920
Warning > 0.001000000	1515799724.547373772	1515799733.648656607	9.101282835

# NEXT GENERATION OF COMPLIANCE IS IN LATE BETA. GENERAL RELEASE IN FEBRUARY

- Scales up to 10s of thousands of clients and multiple years of data (terabytes of data).
- Supports both internal and external reports so IT teams can manage problems before non-compliance
- Far more granular reporting
- User accessible SQL back end for custom reporting and exports
- Alert by source.

# WEB ACCESSIBLE GUI FOR DATA EXPLORATION

Choose report

Generating daily audit(s): 1483833600 (2017-01-08T00:00:00Z)

Report	Report type	Year	Month	Day
Internal alerting - London	Daily	2016	January	1
Internal alerting - Aurora	Weekly	2017		2
Internal alerting - NY4	Monthly			3
Internal alerting - NY2	Yearly			4
Internal alerting - Frankfurt				5
Compliance global report				6

Download daily audit 'Compliance global report' for 2017-01-02



# REPORTS AND VISUALIZATION

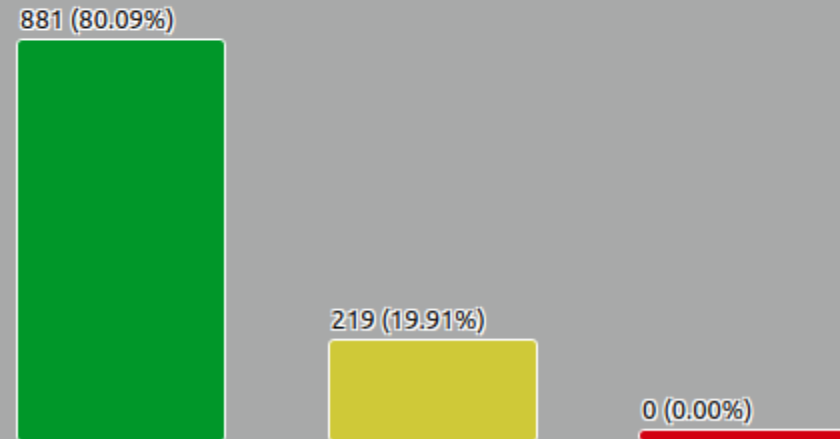
[Download monthly audit 'Compliance global report' for 2017-08-01](#)

## Synchronization report for 2017-08-01

Report start:	Tue, 01 Aug 2017 00:00:00 GMT (1501545600)
Report end:	Fri, 01 Sep 2017 00:00:00 GMT (1504224000)
Report title:	Compliance global report
Report type:	monthly
Client set:	*
Min gap length:	180(s)
Warning threshold:	0.001 000 000
Min warning length:	0(s)
Time > warning:	<b>0.06% client/source time in warning</b>
Alert threshold:	0.050 000 000
Min alert length:	0(s)
Time > alert:	0.00% client/source time out of compliance

## Clients/sources by maximum offset range

Synchronized      Warning      Alert



# ABLE TO DRILL DOWN

No clients gained or lost since last report (which was Sat, 01 Jul 2017 00:00:00 GMT)

## 🔍 Synchronization and quality

IP (hostname)	Source	Max offset	Date/time of offset
<b>Clients &gt;= Alert threshold</b>			
10.0.0.21 (test12.lab.fsmlabs.com)	0	0.001 995 870	Sat, 12 Aug 2017 04:05:35 GMT
10.0.1.41	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.1.21	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.1.81	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.2.81	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.3.80	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.4.61	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.3.220	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.3.221	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.0.101	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.3.101	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.2.161	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.3.21	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.1.141	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.3.41	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.0.240	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.2.201	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT
10.0.2.41	0	0.001 976 049	Fri, 04 Aug 2017 10:02:48 GMT

# SQL REPORTING AND EXPORTS TO EXCEL AND TO OTHER DATABASE FORMATS

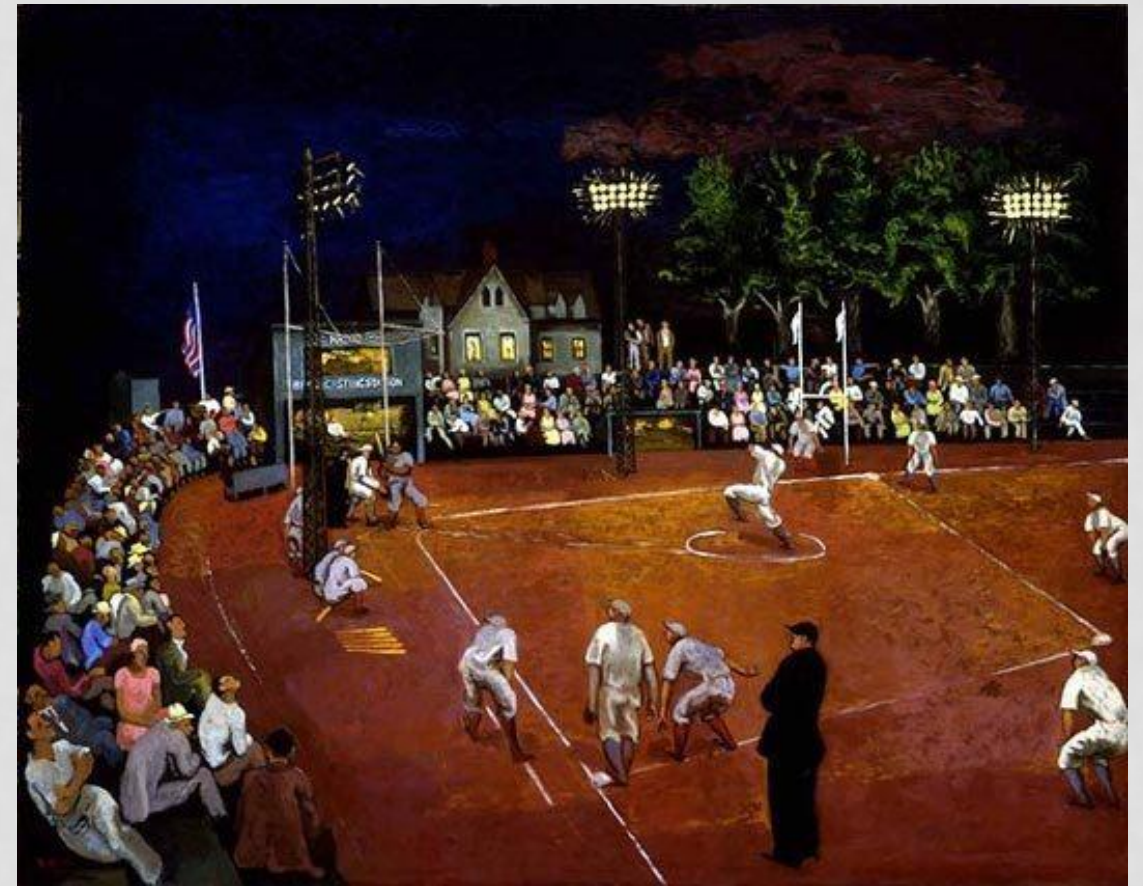
```
SELECT ip, source, start, end, max,  
max_time, time_source  
FROM daily_1500508800_0_alerts  
ORDER BY start DESC;
```



No database vendor or analytics tool lock-in

# TECHNOLOGY PATH: COMPLIANCE RELEASES IN Q2 2018

- GUI makeover
- Security/data integrity features above standard TimeKeeper
- Adjustments for regulatory changes in the game
- Continuing adjustments to customer use cases.



1934 Moris Kantor Baseball at Night

## CONTACT INFO

**Victor Yodaiken**  
**FSMLabs, Inc.**  
**11701 Bee Caves Road, Suite 200**  
**Austin, TX 78738**  
**USA**  
**[yodaiken@fsmlabs.com](mailto:yodaiken@fsmlabs.com)**

**Telephone: 1-512-263-5530**