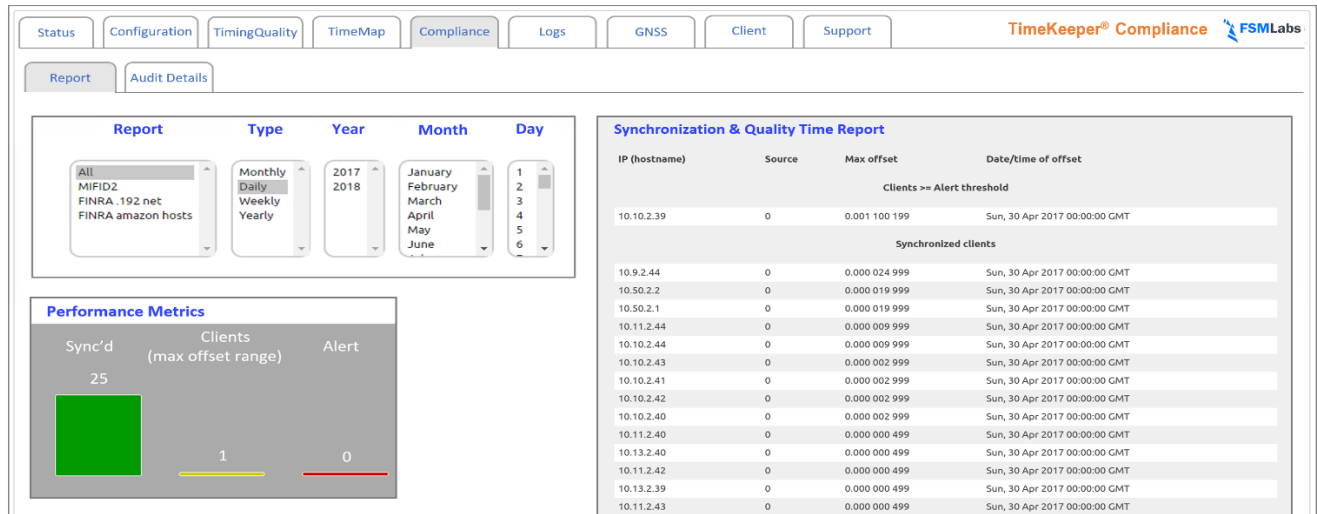




TIMEKEEPER® COMPLIANCE

Smart Clock Sync Management for Real-Time MiFID/FINRA/CAT NMS/UTC Traceable Compliance Reporting



The screenshot shows the TimeKeeper Compliance web interface. At the top, there are navigation tabs: Status, Configuration, TimingQuality, TimeMap, Compliance (selected), Logs, GNSS, Client, and Support. Below these are sub-tabs: Report and Audit Details. The main content area is divided into two sections. On the left, there are filters for Report (All, MIFID2, FINRA_192 net, FINRA amazon hosts), Type (Monthly, Daily, Weekly, Yearly), Year (2017, 2018), Month (January, February, March, April, May, June), and Day (1-6). Below the filters is a Performance Metrics section with a green bar chart for 'Sync'd' (25), a yellow bar for 'Clients (max offset range)' (1), and a red bar for 'Alert' (0). On the right, there is a 'Synchronization & Quality Time Report' table with columns: IP (hostname), Source, Max offset, and Date/time of offset. The table lists various IP addresses and their synchronization details.

TK-Compliance UTC-Traceable Clock Sync Monitoring, Analytics, Reporting & Management

BENEFITS

- Real-time enterprise clock sync reporting compliance made easy for compliance officers and auditors
- *TimeAssurance* technology for maximizing user productivity
- All time clients monitored with their KPIs easily available, with peace-of-mind alerts
- Powerful reporting capability, with custom user-defined reports for regulatory and business requirements
- Secure archiving of all enterprise clock sync data for on-demand proof of compliance

FEATURES

- *TimeAssurance* analytics for UTC and NIST traceable compliance assurance
- *TimeAssurance* alerts on exceeded, user-defined time sync thresholds, including MiFID's 100µs and FINRA's 50ms accuracy requirements
- Redundant **TK-Compliance** servers' capability with **TK-Server's** *TimeMonitor*
- Multiformat reports including plain text, XLS, PDF, and SQL queries
- Displays *Global TimeMap™* of the enterprise clock sync chain topology as an invaluable compliance tool

TIMEKEEPER COMPLIANCE MONITORING AND REPORTING

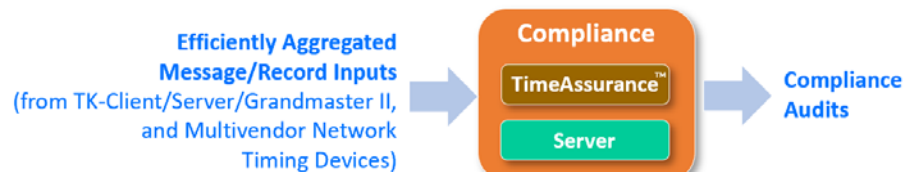
TimeKeeper Compliance (**TK-Compliance**) is a smart clock sync compliance software tool for compliance auditors and auditors, enabling real-time performance monitoring, troubleshooting, analytics, reporting, regulatory compliance, and management, all in a consolidated audit trail. **TK-Compliance** visualizes and monitors the global network timing chain topology, aggregates data from all TimeKeeper Clients (**TK-Client**) and other vendor clients, analyzes and graphs all client KPIs, reports compliance performance divergence, and securely stores all network clock sync records for over 5 years or more. **TK-Compliance** is easy to use and runs on Linux machine.

HOW TIMEKEEPER COMPLIANCE WORKS

TK-Compliance integrates the intelligent TimeKeeper Server (**TK-Server**), which aggregates all time client data while monitoring clients' KPIs, and provides innovative, scalable features for easy compliance analytics and reporting. **TK-Server's** *TimeMonitor™* capability allows users to configure an arbitrary, redundant network of **TK-Compliance** servers for fault tolerance, efficient workloads, and low-latency networks.

TimeAssurance™ Reporting

The *TimeAssurance* technology efficiently aggregates and analyzes all the clock sync data logs from **TK-Client**, **TK-Server's** *TimeMonitor*, and other vendor time clients according to their data aggregation and communication capabilities. *TimeAssurance* generates standard and custom compliance reports for regulatory and business audits, with an intuitive web dashboard.



TIMEKEEPER COMPLIANCE

SPECIFICATIONS

Time sources	<ul style="list-style-type: none"> NTP, PTP, GNSS, CDMA, RS232, IRIG, 1PPS
Time protocols	<ul style="list-style-type: none"> PTP, NTP PTP profiles: Default, Telecom, Hybrid, Enterprise, and others
Networking	<ul style="list-style-type: none"> Ethernet (100M & 25/10/1G) RS232 InfiniBand
Time sensing*	<ul style="list-style-type: none"> NTP, PTP, PPS, TIME (RFC868)
Fault tolerance	<ul style="list-style-type: none"> Multi-time sources over NTP/PTP Failover design Fault alerting Network <i>TimeMonitor</i> <i>Global TimeMap</i> topology
Monitoring	<ul style="list-style-type: none"> Timing quality graphs Time and frequency accuracy
Web management dashboard	<ul style="list-style-type: none"> Text-based CLI Performance monitoring Visual network clock sync topology Clock sync chain traceability to UTC Multi-time source settings NTP/PTP settings Alert settings Configuration settings
OS server/VM supported	<ul style="list-style-type: none"> Linux <ul style="list-style-type: none"> All major distributions (e.g. RHEL5 and newer) Most in-house custom distribution

*For optional features, contact us at support@fsmtime.com

**Disclaimer: We don't provide legal or regulatory compliance advice with regard to any of our products or with respect to the use of our products. You should consult with your attorney and/or regulatory compliance officer for legal and regulatory advice, including regarding compliance with FINRA, MIFID II, CAT, and other regulations.*

Powerful TimeAssurance Reporting Capabilities*

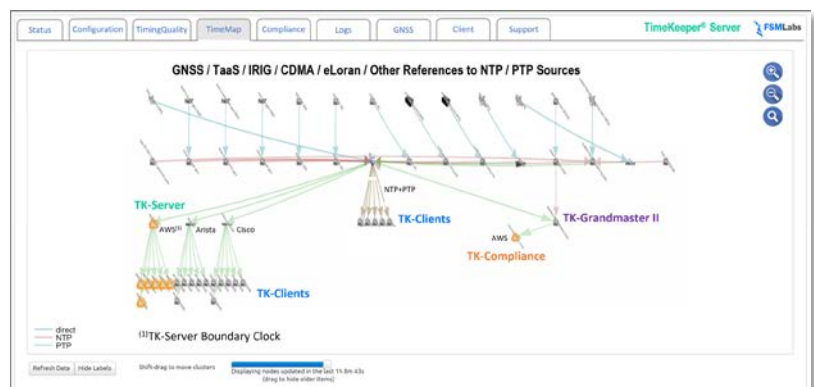
TimeAssurance generates standard and custom compliance reports for various regulatory and business audits, such as MiFID II, FINRA, CAT NMS, SEC 613, PSD2, and UTC/NIST traceability. The report configuration ability enables users to set these powerful features and retrieve data in real time:

- Time clients can be grouped into custom report domains, allowing reports for different business units or classes of devices that are subjected to differing regulatory requirements
- Timestamped events are user-defined by report domain
- Clients' performance thresholds are user-defined
- Alerts are configurable (i.e., if there is any gap in time client data, if any time client is manually tampered with, if any time client exceeds a set threshold or a set user warning value, and if any time client host [application server or VM] is added or removed during the reporting period) for compliance assurance that all hosts were monitored
- Report frequency is configurable by day, week, and month, in any combination

TimeAssurance also allows users to generate reports in multiple formats automatically, including txt, SQL, XLS, and PDF. Reports are instantly viewable via interactive web presentations, and on-demand custom reports can be generated using SQL queries.

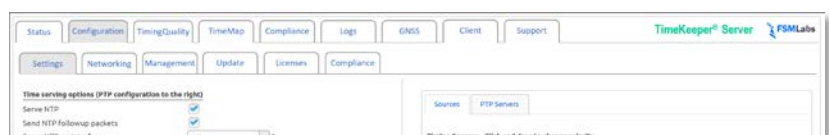
Global TimeMap

Powered with **TK-Server**, **TK-Compliance** equips users with an effective planning tool to visually display the global enterprise-wide clock sync network topology of multivendor clients and time servers, as well as the intelligent **TK-Client**, **TK-Server** as a boundary clock, and **TK-Grandmaster II** appliance. Critical UTC traceable direct and indirect paths of primary reference time sources, such as GNSS, terrestrial TaaS (Time-as-a-Service) feeds, IRIG, CDMA, and any other source that serves time, are tracked and displayed in real-time. Users can view or diagnose the time source profile of each TimeMap node (IP hostname, MAC, accuracy, and more).



Web Management Dashboard

TK-Compliance is designed with **TK-Server's** intuitive web management dashboard, providing comprehensive user control features such as installation, configuration, performance monitoring/analytics, UTC-traceability, alert notification, fault logs, CLI, support, administration, and more. **TK-Compliance** settings can be changed without affecting the clock sync operation.



TIMEKEEPER COMPLIANCE

WHY USE TIMEKEEPER TO TIME-SYNC YOUR CRITICAL ENTERPRISE APPLICATIONS?

TK-Platform provides secure, resilient, state-of-the-art enterprise clock sync at higher accuracy than competing products, while providing the lowest TCO. Get a [TimeAudit](#) and see the difference.

TK-Platform is the gold standard in secure enterprise clock sync, used by hundreds of large organizations including banks, financial institutions, government agencies, and more.

TK-Platform consists of integrated products for secure clock sourcing, distribution, synchronization, monitoring, management, and administration. Products include:

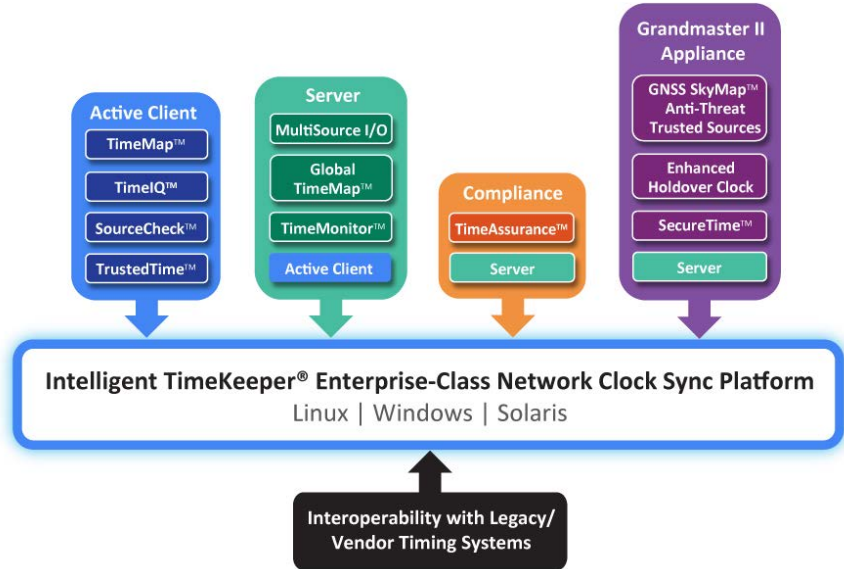
- TK-Platform (includes all products)
- TK Active Client
- TK-Server
- TK-Compliance
- TK-Grandmaster II

TIMEKEEPER ENTERPRISE-CLASS APPLICATIONS

- | | |
|-----------------|------------------|
| • Financial | • Automation |
| • Data center | • Cloud Database |
| • 5G IoT | • Gaming |
| • Cybersecurity | • Broadcast |

TIMEKEEPER ENTERPRISE-CLASS NETWORK CLOCK SYNC PLATFORM

TK-Compliance is a component of the intelligent, patented TimeKeeper enterprise-class network clock sync platform. TimeKeeper Platform (TK-Platform) has the flexibility to operate with any legacy NTP/PTP infrastructure and to be configured with failover capability. TK-Compliance is vendor-agnostic, connects to multisource NTP/PTP feeds over the network, is compatible with a mix of timing vendors, and is fault-tolerant by design.



ENTERPRISE-CLASS TIMECARESM SERVICES

Our industry-leading TimeCare line of services helps our customers keep their network clocks time-synced 24/7 to run their server applications reliably and in compliance with regulatory requirements.

[GET A TIMEAUDIT](#)

Get a TimeAudit today and check your enterprise clock sync performance and compliance by contacting us at sales@fsmtime.com.

[SCHEDULE A DEMO](#)

Contact us at sales@fsmtime.com to get a live demo today.

[PLACE AN ORDER](#)

Contact us at sales@fsmtime.com to order these product part numbers directly from us or through our global value-added resellers:

- | | |
|-------------------|---|
| TK-Compliance | TK-CMPL |
| TK Active Client | TK-CL-S/M (Single or Multiple) |
| TK-Server | TK-SV-PN |
| TK-Grandmaster II | TK-GM/Rb (Grandmaster GPS/GNSS/XO or with Rb clock) |

Intelligent TimeKeeper Platform Products & Services

Secure Enterprise-Class Clock Synchronization for Time-Critical Operations and Business Applications

