

Delivering accurate time to the application

With industry-leading accuracy of up to 10s of nanoseconds, HoptroffTime™ distributes synchronised time that enables end-to-end timestamping of trade flows. The solution combines hyper-accurate atomic ‘grandmaster clocks’ with patent-pending software that automatically corrects for latency right through to application level.

The solution has built-in redundancy features, is co-locatable with minimal power and space requirements, and does not normally require upgrades to existing infrastructure and networks.

A HoptroffTime™ installation comfortably exceeds MiFID II RTS-25 reporting and forensics requirements. It is a powerful tool for defining, comparing and masking your latency profile; identifying when others seek to exploit that profile; and generating data insights that support marketing to clients, regulatory compliance, and robust defence against disputes.

The solution is the result of intensive research, testing and benchmarking by Hoptroff London – founded by physicist Richard Hoptroff, and developer of the world’s most accurate atomic timepieces for consumer markets.

Hoptroff London’s financial sector products and services are licensed exclusively through emagine.

HoptroffTime™ synchronised atomic timestamping is an elegant, unique self-contained solution for financial institutions that need to demonstrate high levels of consistency, traceability and granularity against Coordinated Universal Time (UTC).



Benefits at a glance

HoptroffTime™ is the only solution that delivers traceable UTC right down to the application level, exceeding MiFID II compliant levels by orders of magnitude. Designed for the finance industry, its business advantages include:

- Irrefutable accuracy for better defence against disputes with other parties.
- Prevent other parties from exploiting synchronisation delays with trading venues, by reliably defining latency profile of own organisation compared with others.
- Drive up customer/market reputation by transparently demonstrating competitive efficiency.
- Ensure uninterrupted trading if UTC feeds fail. HoptroffTime™ is highly resilient and able to maintain holdover accuracy for up to three weeks.

HoptroffTime™ uses rack-mounted non-invasive technology that works as a grandmaster timing source for your entire data centre infrastructure. Where space is at a premium, credit card-sized grandmasters can be fitted into existing servers.

- Reuse existing network infrastructure – normally no need to upgrade.
- No need to re-code applications.
- Save on expensive additional co-located power and space.

What does HoptroffTime™ comprise?

HoptroffTime™ uses proprietary Hoptroff London GMC™ atomic clocks installed in the data centre, ResilientPTP™ technology to distribute UTC, and PacketPrecision™ software to measure and adjust for latency within the server.

The grandmaster acquires UTC using GPS, GLONASS, NPL or NIST via satellite or fibre optic distribution, and the system's own software automatically corrects for latency, steering accurate time all the way down to server and application level.

In this way, timestamps are accurately synchronised between every application, on every server, at every location.

HoptroffTime™ constantly monitors application timestamping latency and logs packet-by-packet timing for reporting and later analysis.

The system can provide nanosecond granularity, with variance of up to 1 second every 10,000 years, exceeding MiFID II's specification by orders of magnitude.

Hoptroff London GMC™ atomic clocks

The grandmaster clock at the heart of the system uses chip scale atomic clock (CSAC) technology – developed for defence applications – which connects to the network card. The clock forms part of a standard HoptroffTime™ appliance, which occupies a 1U rack space. Each grandmaster's software manages time distribution and monitoring functions.

For co-located sites and where space and power are at a premium, Hoptroff London GMC™ grandmaster atomic clocks are available as ultra-low power credit card-sized inserts that can fit inside existing servers. This unique feature not only helps keep down the cost of rack space but – by making the grandmaster actually part of the server – removes another latency obstacle. Should a grandmaster cease operating the timestamping servers will failover to the best alternative. Should all time sources and/or switches cease it will 'holdover' without reference to an exterior time source to an accuracy of 100 microseconds for up to three weeks.



Rack mount Hoptroff London GMC™ atomic clock.

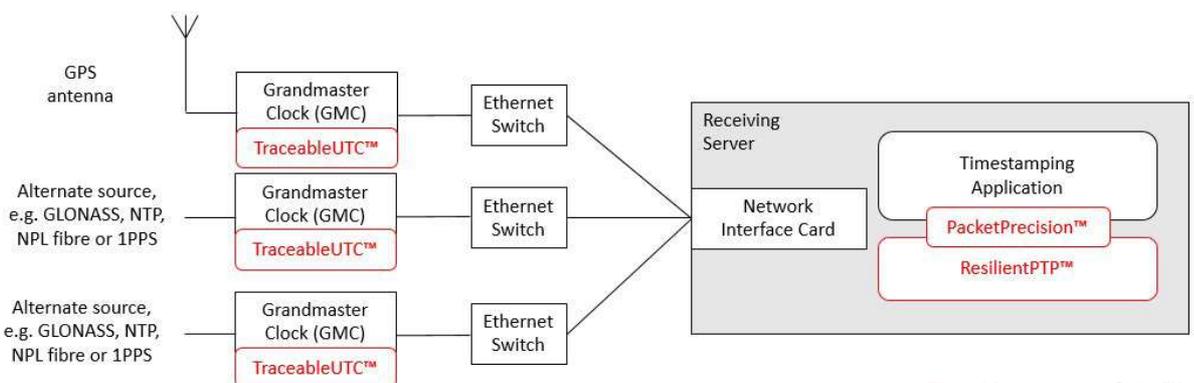
Time Management Suite™

We implement PTP (IEEE 1588) and/or NTP time distribution, whichever is optimal, and in most cases without the need to replace existing network architecture. The load on the network is measurable, minimized through careful implementation, and ultimately negligible.

The software layer provides the first layer of service support as it reports any drift in timing accuracy or server synchronization outside set parameters. If the fault cannot be corrected at the data centre, then it will be escalated to the service support desk which will provide any necessary software fixes or replacement components to restore the coherence of the timing network without any interruption in service.

Time Management Suite™ contains several unique, patent pending innovations:

- ResilientPTP™ time distribution that allows individual trading servers to determine which time source is locally most stable.
- PacketPrecision™ determination of the latency between the server's clock and the application timestamp.
- TraceableUTC™ timekeeping compliance reporting managed centrally by the Grandmaster Clocks.



Time Management Suite™

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