

# TIME-AS-A-SERVICE

Microsecond accurate traceable synchronization delivered from the cloud as a global network service

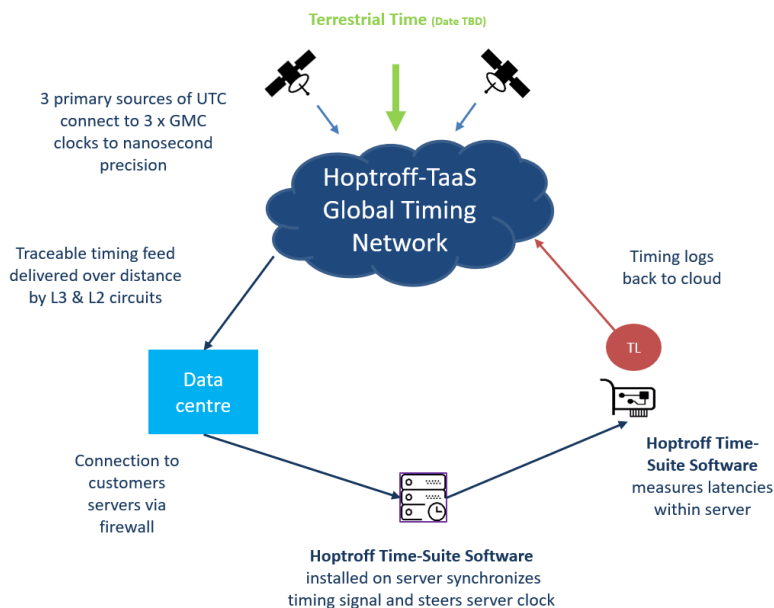
BSO has partnered with Hoptroff, a pioneering technology services company which has developed Hoptroff Time-as-a-Service, **Hoptroff-TaaS**. BSO and Hoptroff's TaaS is an innovative new software solution for synchronizing clocks on servers in distributed locations that delivers a more cost-effective alternative to current hardware based solutions.

Traditional hardware-based solutions have major shortcomings:

- Involve significant up-front costs and ongoing fees
- Relatively difficult to deploy and scale quickly across multiple locations

Hoptroff-TaaS eliminates the need for costly hardware. Its unique software and timing "hub & spoke" methodology enables easy, cost efficient and seamless deployment across multiple locations. It is easier and cheaper to install than acquiring timing hardware and integrating it with third party software as it is a single source solution. You just need to establish a connection to the Hoptroff Global Timing network and download the Time-Suite software to be fully operational.

## Hoptroff-TaaS System Overview



## Simple Two-Stage Deployment Process:

1. Connect to the Hoptroff Global Timing Network (BSO can provide this)
2. Install the Hoptroff Time-Suite Software

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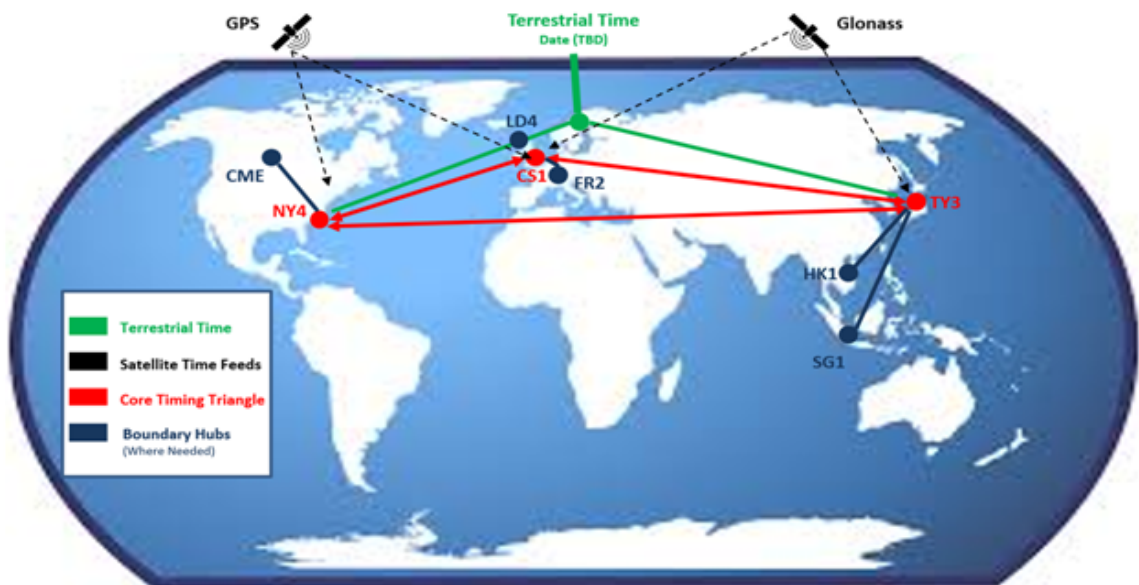
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## THE HOPTROFF-TAAS GLOBAL TIMING NETWORK

The Hoptroff TaaS Global Timing Network is a network of resilient cloud timing hubs, each consisting of three Nano-second accurate Grandmaster Clocks connected to three different UTC sources to create a resilient traceable time feed.

The hubs continuously compare the different timing sources to ensure accuracy and source traceability.

You can secure connection to the Hoptroff timing network via BSO and then download the Hoptroff AI enabled Time-Suite software to your servers.



### Key Benefits

**Cost Effective** – Up to 5 x more cost effective than current hardware-based solutions

**Resilient** – Combines Satellite and Terrestrial time feeds for end to end resilience

**Terrestrial Time Source** – via recognized BIPM\* UTC source (Date TBD)

**Global Availability** – Across all key global trading centers (Q4-2018)

**Scalable** – “Connected Hub & Spoke” approach for fast multi-location deployment

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## HOPTRUFF TIME-SUITE SOFTWARE

Hoptroff Time-Suite is state of the art Artificial Intelligence enabled software that synchronizes the local server clock to the best of the three timing signals and measures the latency between the server clock and the application it is running, to establish the granularity of timing on each machine. The timing logs generated by Time-Suite are distributed back to the cloud and securely stored so that they can be accessed 24/7.



Hoptroff Time-Suite is available in two versions:

### 1. Hoptroff-Time-Suite

Provides the Time-Feed and Clock Synchronization  
Customer self-manages Reporting & Compliance

### 2. Hoptroff Time-Suite Premium

Provides the Time-Feed and Clock Synchronization  
Hoptroff provide a fully managed Reporting & Compliance service

		
Satellite Time Feed	✓	✓
Terrestrial Time Accreditation & Back-Up	✓	✓
Server Clock Synchronization	✓	✓
Monitoring & Reporting	Client Manages	✓
Compliance	Client Manages	✓

## Key Benefits

**Flexible:** Available in 2 versions. 1) Hoptroff Fully-Managed 2) Customer Self-Managed

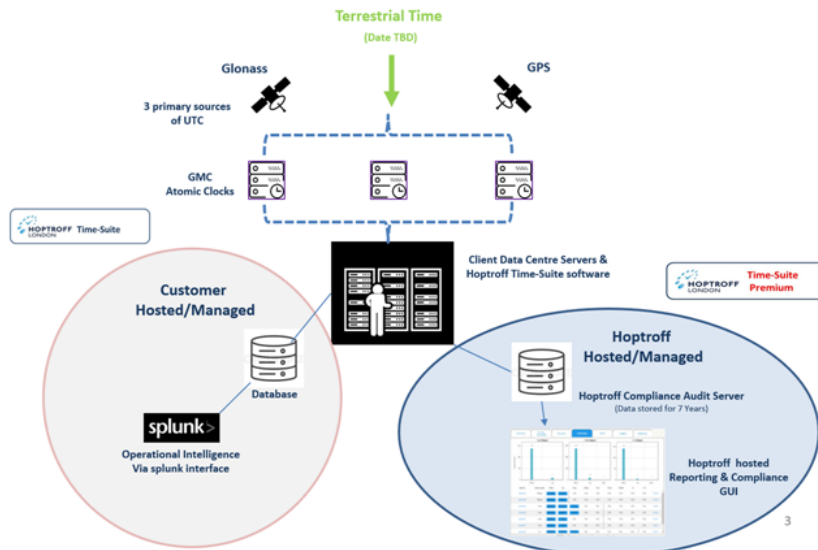
**Full Regulatory Compliance** – CAT & MiFID II RTS 25 compliant

**Easy to Deploy** – No hardware needed and no upgrades to existing equipment

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## TIME-SUITE VS. TIME-SUITE PREMIUM



Time-Suite Premium offers a fully managed solution, where Hoptroff hosts and manages the reporting and compliance components on your behalf. Hoptroff Time-Suite differs in that it provides just the Time-Source & Server Clock Synchronization software and where you retain responsibility for hosting and managing the reporting and compliance component.

### Key Specifications

	Time-Suite	Time-Suite Premium
Linux Support	RHEL 5, 6, 7	RHEL 5, 6, 7
Windows Support	2008R2, 2012, 2016	2008R2, 2012, 2016
Time-Feed	GPS Glonass Terrestrial Time (Date TBD)	GPS Glonass Terrestrial Time (Date TBD)
PTP Profiles	Unicast, Hybrid	Unicast, Hybrid
Compliance Logging	Customer Self-Managed	Hoptroff Managed
Monitoring	Customer Self-Managed	Hoptroff Managed
Alerting	email	email SNMP