

Nasdaq Nordic PTP Services[®]

MiFID II mandates clock synchronization at European exchanges and trading firms. Nasdaq seeks to offer a Precision Time Protocol (PTP) service for its Nordic Co-Location customers at the Vasby datacenter to meet such requirements. Customers subscribing to the service will be using the same clock source as the Nasdaq trading systems. The service is utilizing the PTPv2 protocol to synchronize clocks to achieve nanosecond accuracy and can be used for Time Synchronization, Compliance, Latency Calculations, Troubleshooting, Fine Tuning Trade Algorithms and Precision Trade Capture.

Cutting-Edge Technology

- The service utilizes the Meinberg M3000, a versatile and Modular Time and Frequency Synchronization Platform as the Grand Master Clock Sources
- The maximum accepted difference from UTC: $\pm 10 \mu\text{s}$, provided that Nasdaq receives the correct time from its clock source
- In case of GPS signal loss, the internal oscillators timer allows for max clock drift of $\pm 30 \mu\text{s}$ within a 24hr period
- Timestamping at nanosecond accuracy

Service Resiliency

- Nasdaq offers 2 clock sources in the data center. Dual handoffs required for full redundancy
- The PTPv2 network architecture offers clients resiliency in Grand Master clock sources and greater accuracy in time when syncing to these clock sources

Distribution Network

Co-located clients peer via dedicated Nasdaq supplied 10G or 1G cross connects into distribution switches acting as boundary clocks to sync directly to the Grand Masters for all PTPv2 protocol messaging. Clients consuming PTP in this manner need to be capable of listening to the IEEE 1588 standard Multicast groups for "Announce," "Sync," and "Follow Up" messages.

The Grand Master clock will send multicast "Delay Reply" messages back to interested parties who register "Delay Requests". Clients connect their own managed Boundary Clock using the service as the source.

Traceability

Nasdaq is continuously comparing its time representation with UTC(SP), as realized by RISE Research Institutes of Sweden. Repeated calibrations of Nasdaq's timing infrastructure assure UTC traceability and clients can use published reports to demonstrate their traceability to UTC.

Monitoring and Alerting

Nasdaq is continuously monitoring the health of the Grand Master Clocks in addition to the distribution network. Alerts are published to all PTP clients to notify clients of potential faults they may encounter with their PTP clocks.

Contact Information

Richard Gaudy Head of Sales, Europe
Global Connectivity Services
Email: richard.gaudy@nasdaq.com
Phone: +46 405 6103

Per Wettergren Head of Business Development, Europe
Global Connectivity Services
Email: per.wettergren@nasdaq.com
Phone: +46 8 405 6382