Using Provenance to satisfy MiFID 2 regulatory timing demands

When MiFID 2 takes final effect in January 2018, traders face a raft of new technical requirements imposed by new MiFID 2 regulatory technology standards (known as RTS).

One of these – RTS 25 – regulates the technical standards covering the accuracy of clocks used to timestamp trade data as it is recorded for archiving. The purpose of this standard is ensure that events relating to an order can be reconstructed accurately from the recorded history throughout the lifetime of each order – even when individual trade events may be separated by just microseconds, as is the case in high-speed algorithmic trading (HFT) environments.

Under MiFID 2's proposed RTS 25 regulations, clocks used for timestamping must be accurately synchronized to Coordinated Universal Time (UTC), and timestamps must be accurate to within levels specified for different types of trades. For high-frequency algorithmic trading, the precision of timestamps applied to trade data must be 1 microsecond or better, and the maximum allowable divergence from UTC is 100 microseconds.

The benefits of wire capture and hardware-based timestamps

Commonly, high-frequency traders have implemented network packet capture solutions in order to ensure complete capture of trade data for archival and the accuracy of timestamps that are applied as that trade data is recorded.

Endace's DAG™ Data Capture Cards are capable of 100% accurate capture and recording of network packets at line speed even on high-speed links such as those commonly found in HFT environments. Additionally, they record highly accurate timestamps for captured traffic.

THE CHALLENGE

- MiFID 2 imposes tough new standards on traders to ensure trade data is accurately time stamped as it is recorded
- High-speed, algorithmic traders must ensure timestamp accuracy to within 100 microseconds of UTC at 1 microsecond granularity, and be able to demonstrate this accuracy for audit purposes

THE SOLUTION - PROVENANCE

- Allows automatic recording of timing environment information and status as trade data is recorded
- Provides an embedded, easily referenceable record of timing accuracy for all recorded trade data
- Offers a way to satisfy MiFID 2's tough new regulatory demands with little or no compliance overhead.
- Ensures recording infrastructure is future-proofed - Provenance data can be extended and customized to meet new regulatory or business requirements

When synchronized with an accurate time source, such as a GPS receiver, DAG cards can timestamp captured packets to within 100 nanoseconds accuracy at a resolution of four nanoseconds – well within the accuracy levels dictated by MiFID 2's RTS 25 directive, and providing future proofing for future regulatory regimes.

However, providing a sufficiently accurate timestamping source for recorded trade data and ensuring that source is accurately synchronized with UTC is just the first part of satisfying RTS 25's timing requirements.

Why continuous monitoring of time accuracy is critical

Article 4 of the proposed RTS 25 standard outlines the obligations for timing traceability that traders must satisfy:

"*Operators of trading venues and their members or participants shall establish a system of traceability to UTC. They shall be able to demonstrate traceability to UTC by documenting the system design, functioning and specifications. They shall be able to identify the exact point at which a timestamp is applied and demonstrate that the point within the system where the timestamp is applied remains consistent. Reviews of the compliance with this Regulation of the traceability system shall be conducted at least once a year.*"[1]

The key point to note in the above paragraph is that traders are required to document the functioning of their system of traceability to UTC and be able to demonstrate that.

Because timing accuracy can vary due to a host of variables such as system and network load, cross traffic, temperature variation, configuration changes, and clock drift, that means traders must continually monitor and record the performance of their timing system so they can prove it was functioning correctly at any given point in time. This is the only way traders can prove that the timestamps applied to recorded trade data were accurate to within the required tolerance at the time that trade data was captured and thus satisfy the requirements of RTS 25.

How Provenance can help traders satisfy MiFID 2 requirements easily

Provenance™, is a new feature that Endace is introducing across its network recording products to help customers to solve exactly the sort of problem that complying with MiFID 2's new regulations introduces.

Put simply, Provenance enables recorded network traffic to be automatically "watermarked" every second with a rich set of additional data fields that describe the environment and the status of that environment at the time the capture occurred. This enriched data is embedded into the stream of the captured network data, forming a permanent and easily referenceable record of the status of the environment as packets were captured. This Provenance data includes things such as the hostname, link name, capture port, capture location, link type and link speed just to name a few.

Critical to satisfying MiFID 2's RTS 25 directives, Provenance data also includes a wide variety of data about the type of timing infrastructure in place at the time of capture. For example, what the timing source was, what method of time synchronization was used (PTP, 1PPS or IRIG-B) and what the accuracy of that time source was at the time of capture.
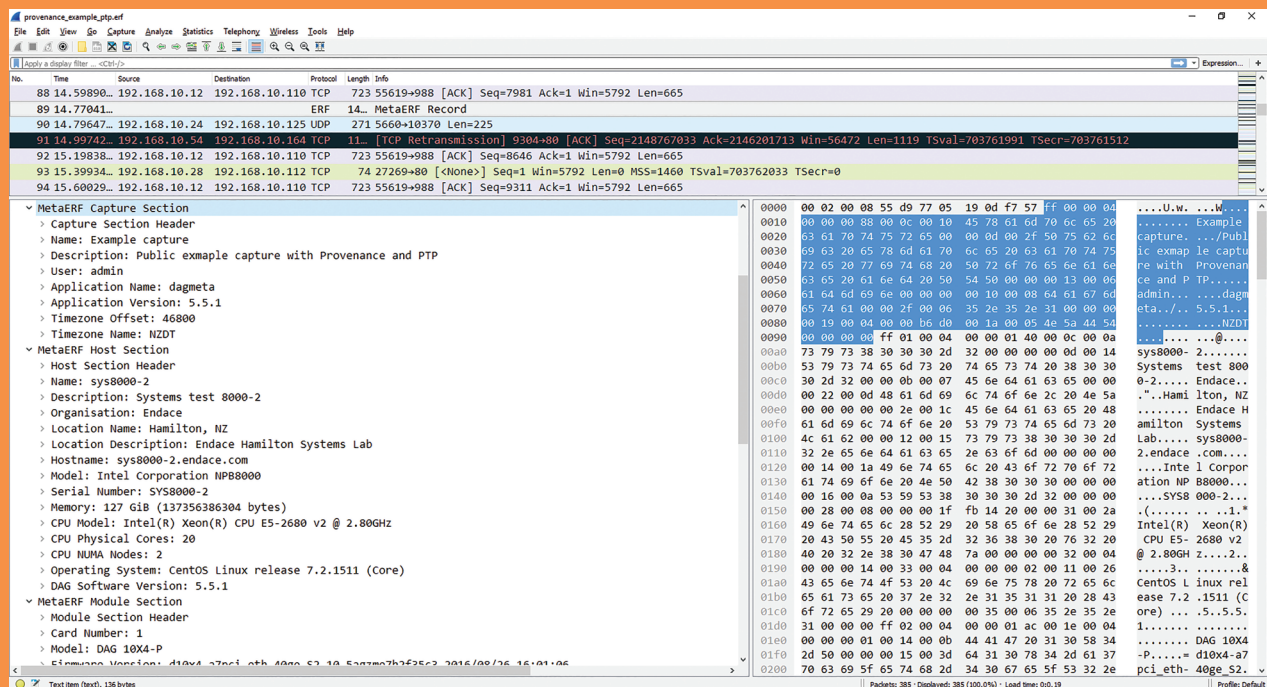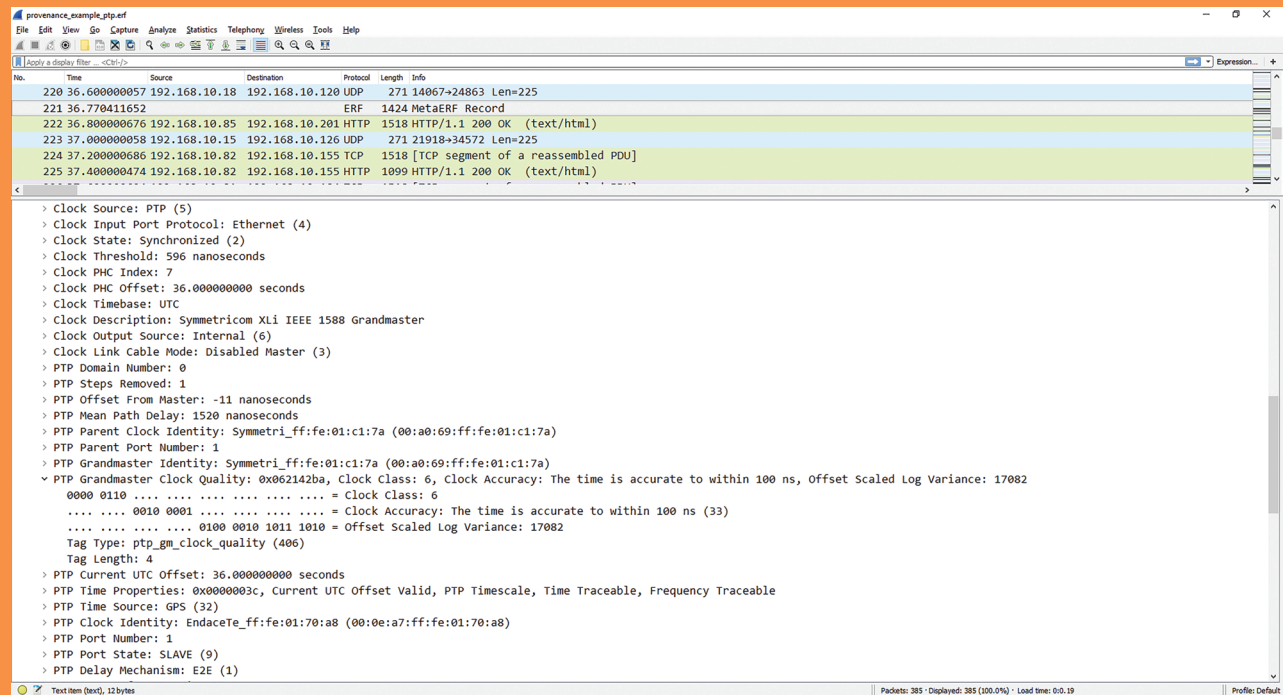
This additional Provenance data forms an embedded record of the timing infrastructure and accuracy at the time that trade data is recorded. It allows traders to address MiFID 2 directives simply and easily – without requiring a separate system or process for monitoring timing systems or imposing any overhead in correlating recorded trade data with timing data. The relevant timing data is monitored and generated automatically, and embedded in the recorded trade data as it is captured – ensuring full context is maintained. Embedded Provenance data can be easily examined using standard packet analysis tools, such as Wireshark™, enabling easy historical analysis of trade data to ensure that MiFID 2 timing accuracy requirements were met as that trade data was recorded.

Provenance also ensures that your recording infrastructure is future-proofed. As regulatory demands or business needs evolve in the future, Provenance data can be extended to add additional data fields to enrich recorded network traffic – including custom fields that might be required for specific application usage.

A quick look at Provenance in action

The screenshots below show some of the additional information available in a Provenance record as viewed in Wireshark. As outlined above, these records are embedded in captured network traffic every second – forming a continuous record of the environment as traffic is captured.

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1. Regulatory technical and implementing standards – Annex I. MiFID II / MiFIR.
   Available for download from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2015-esma-1464_annex_i_-_draft_rts_and_its_on_mifid_ii_and_mifir.pdf, page 505.

Figure 1 - Capture file showing Provenance record with top-level host data

Figure 2 Capture file showing some of the timing data available in Provenance records

How do I get Provenance?

Provenance was introduced as a new feature in the DAG 5.5.1 software release in October 2016, and is supported on all DAG 10X capture cards including the 2-port DAG 10X2-S and DAG 10X2-P cards and the quad-port DAG 10X4-P.
DAG 5.5.1 is available free to customers with DAG support.

As a key new feature of Endace's network recording technology, Provenance will also be introduced on EndaceProbe network recorders with the release of OSm 6.3, a new version of the EndaceProbe operating system, in Q1, 2017.

Conclusion

Provenance offers an easy-to-implement, and automated mechanism for continuously monitoring and recording timing accuracy data alongside recorded trade data.

Coupled with the timestamp accuracy offered by Endace DAG technology, Provenance allows traders to be confident they can ensure accurate timestamps on all recorded trades and collect and archive the data needed to meet regulatory demands that will come into force with MiFID 2's RTS 25 directive.

For more information on the Endace portfolio of products, visit: endace.com/products

For further information, email: info@endace.com

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