How Provenance™ can make MiFID 2 timing compliance easy

The Challenge

New MiFID 2 timing regulations for recording trade data (RTS 25)

- **Highly accurate timestamps required for high-frequency trade data**
  - Must be synchronized to UTC
  - Granularity: 1 microsecond or better
  - Maximum divergence from UTC: < 100 microseconds

- **Traceability requirements**
  - *Must be able to demonstrate traceability to UTC by documenting the system design, functioning and specifications*

The Problem

Timing accuracy can change over time

- Clock drift, system or network load, cross-traffic, configuration changes ..

Burden of proof is on traders

- To prove timestamps were accurate when trade data recorded

Need to continuously monitor and record timestamp accuracy

- How to do this?
- Needs to be easy to correlate with recorded trade data
- Minimize compliance overhead

The Solution - introducing Provenance

New feature of Endace DAG™ data capture cards

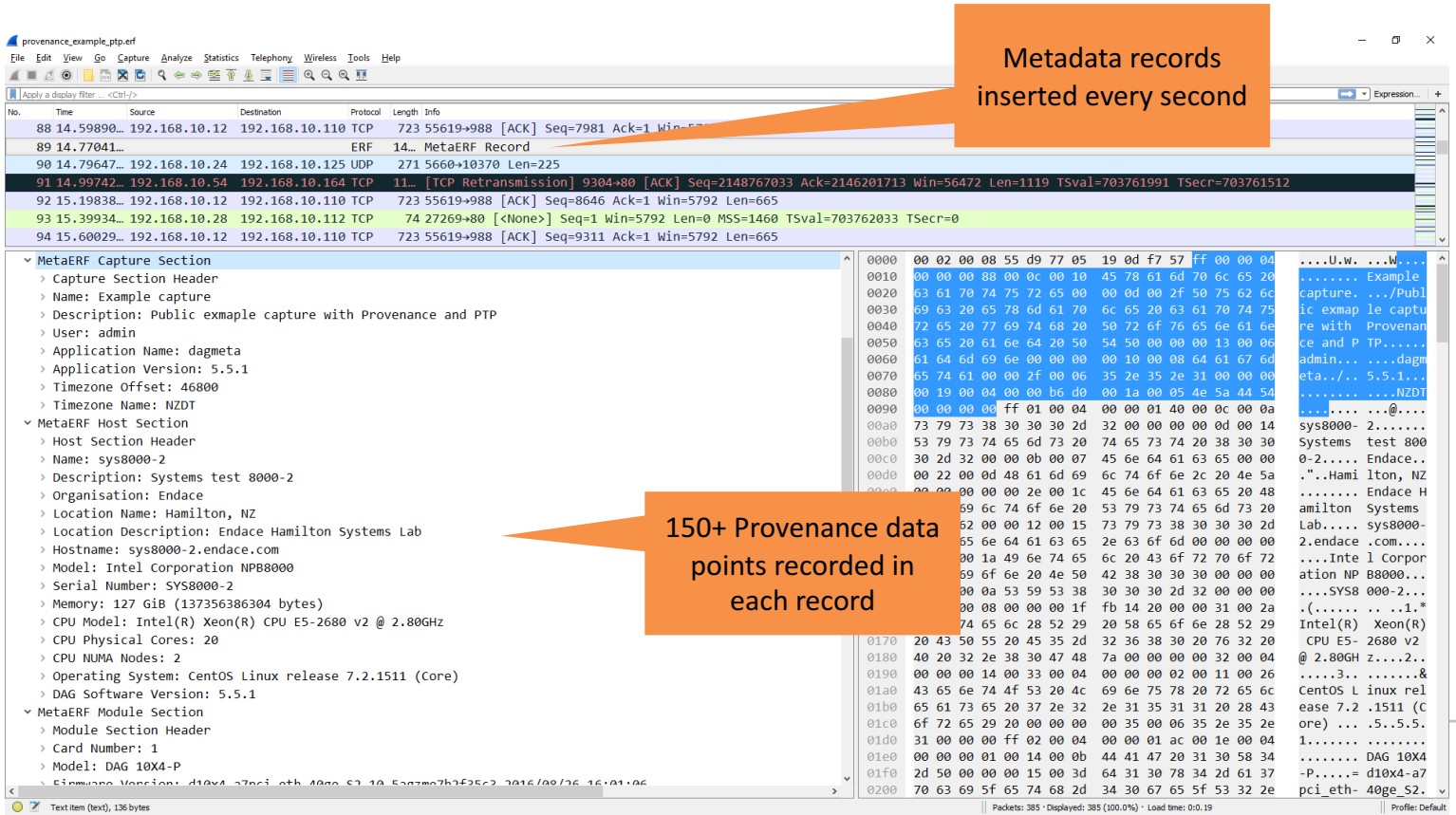
Watermarks recorded traffic every second with additional rich data

- **Full timing data**: time source, synchronization method, clock accuracy (drift)
- **And 150+ other data points**: hostname, location, link name, link type and many more

Provenance records automatically embedded in recorded traffic

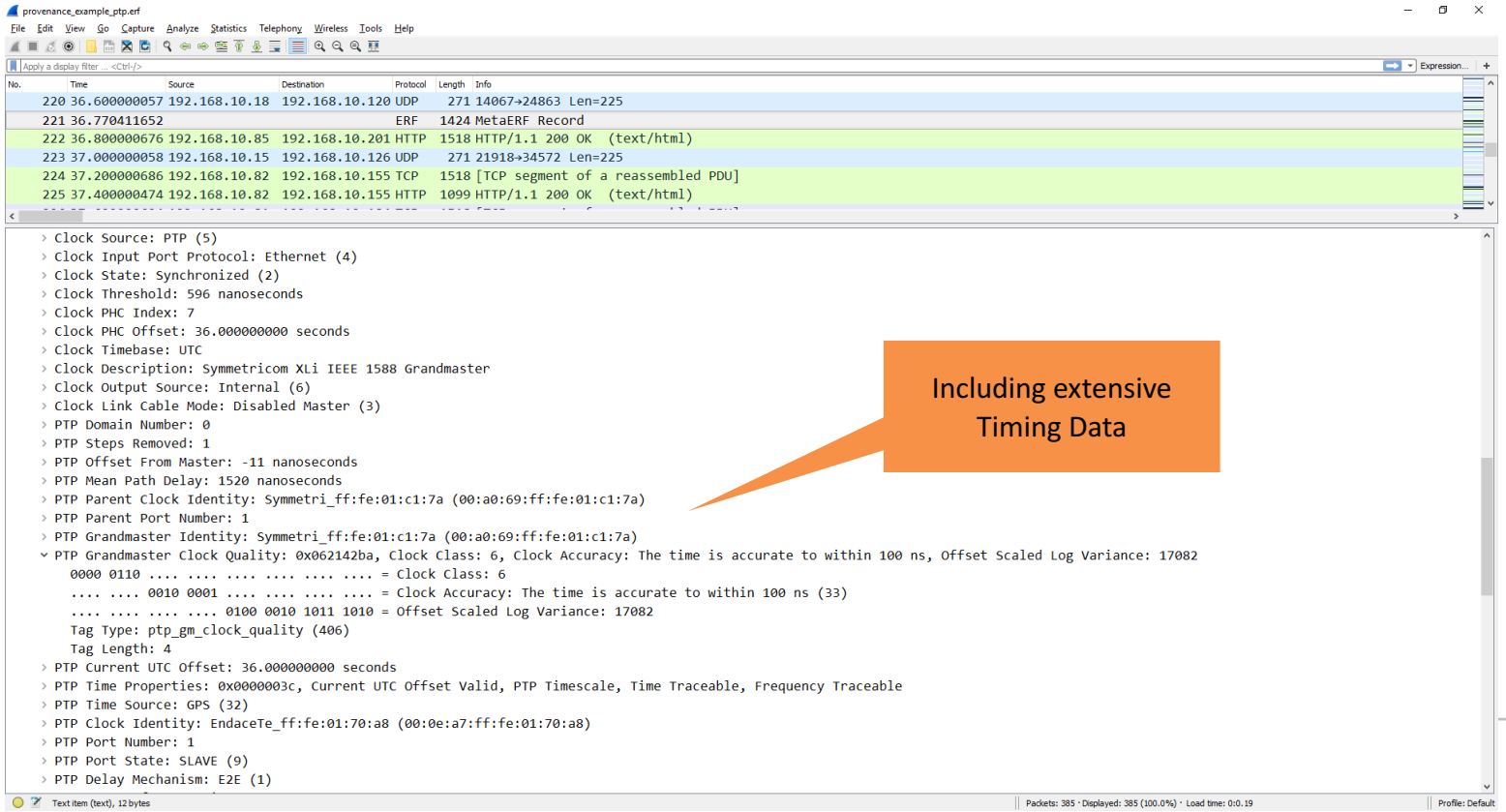
- A permanent indelible record archived alongside recorded trade data
- Maintains full context
- Easy to reference with standard packet tools e.g. Wireshark
- Extensible format – future proof for evolving business/regulatory needs

A quick look



endace

A quick look


provenance_example_ptp.erf
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
No. Time Source Destination Protocol Length Info
220 36.600000057 192.168.10.18 192.168.10.120 UDP 271 14067→24863 Len=225
221 36.770411652 ERF 1424 MetaERF Record
222 36.800000676 192.168.10.85 192.168.10.201 HTTP 1518 HTTP/1.1 200 OK (text/html)
223 37.000000058 192.168.10.15 192.168.10.126 UDP 271 21918→34572 Len=225
224 37.200000686 192.168.10.82 192.168.10.155 TCP 1518 [TCP segment of a reassembled PDU]
225 37.400000474 192.168.10.82 192.168.10.155 HTTP 1099 HTTP/1.1 200 OK (text/html)
Clock Source: PTP (5)
Clock Input Port Protocol: Ethernet (4)
Clock State: Synchronized (2)
Clock Threshold: 596 nanoseconds
Clock PHC Index: 7
Clock PHC Offset: 36.000000000 seconds
Clock Timebase: UTC
Clock Description: Symmetricom XLi IEEE 1588 Grandmaster
Clock Output Source: Internal (6)
Clock Link Cable Mode: Disabled Master (3)
PTP Domain Number: 0
PTP Steps Removed: 1
PTP Offset From Master: -11 nanoseconds
PTP Mean Path Delay: 1520 nanoseconds
PTP Parent Clock Identity: Symmetri_ff:fe:01:c1:7a (00:a0:69:ff:fe:01:c1:7a)
PTP Parent Port Number: 1
PTP Grandmaster Identity: Symmetri_ff:fe:01:c1:7a (00:a0:69:ff:fe:01:c1:7a)
PTP Grandmaster Clock Quality: 0x062142ba, Clock Class: 6, Clock Accuracy: The time is accurate to within 100 ns, Offset Scaled Log Variance: 17082
0000 0110 .... = Clock Class: 6
.... 0010 0001 .... = Clock Accuracy: The time is accurate to within 100 ns (33)
.... 0100 0010 1011 1010 = Offset Scaled Log Variance: 17082
Tag Type: ptp_gm_clock_quality (406)
Tag Length: 4
PTP Current UTC Offset: 36.000000000 seconds
PTP Time Properties: 0x0000003c, Current UTC Offset Valid, PTP Timescale, Time Traceable, Frequency Traceable
PTP Time Source: GPS (32)
PTP Clock Identity: EndaceTe_ff:fe:01:70:a8 (00:0e:a7:ff:fe:01:70:a8)
PTP Port Number: 1
PTP Port State: SLAVE (9)
PTP Delay Mechanism: E2E (1)
Including extensive Timing Data
Text item (text), 12 bytes
Packets: 385 · Displayed: 385 (100.0%) · Load time: 0:0.19
Profile: Default

How do I get Provenance?

- Available **NOW** on all DAG 10X cards

  - Dual port: DAG 10X2-S and DAG 10X2-P
  - Quad port: DAG 10X4-P

- **Q1, 2017** on EndaceProbe Network Recorders

  - New OSm release 6.3 in Q1, 2017

New Pricing!

DAG 10X2-S

- Dual port 1/10 GbE card
- 100% accurate recording
- Nanosecond-level accurate hardware time-stamping
- Dedicated SFP Time Sync Port

Now just US$2500 per card

Questions?

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