

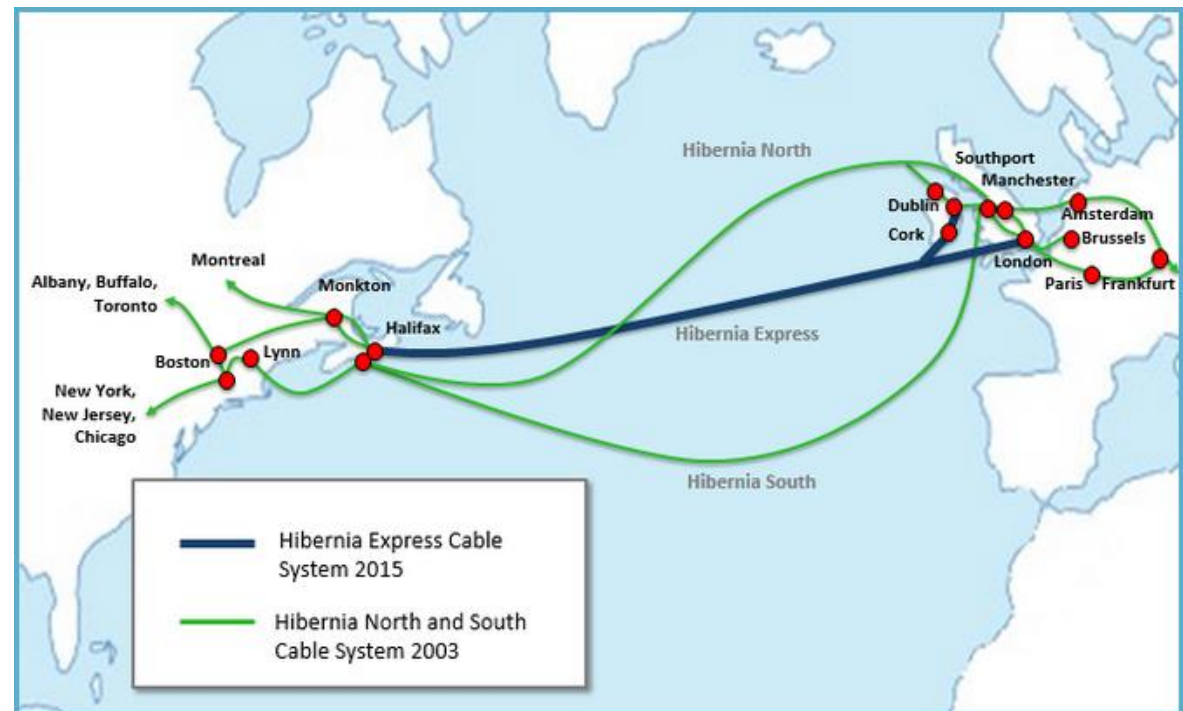
**Financial sector engagement**

*CCTF 18<sup>th</sup> Sept 2015*

Leon Lobo

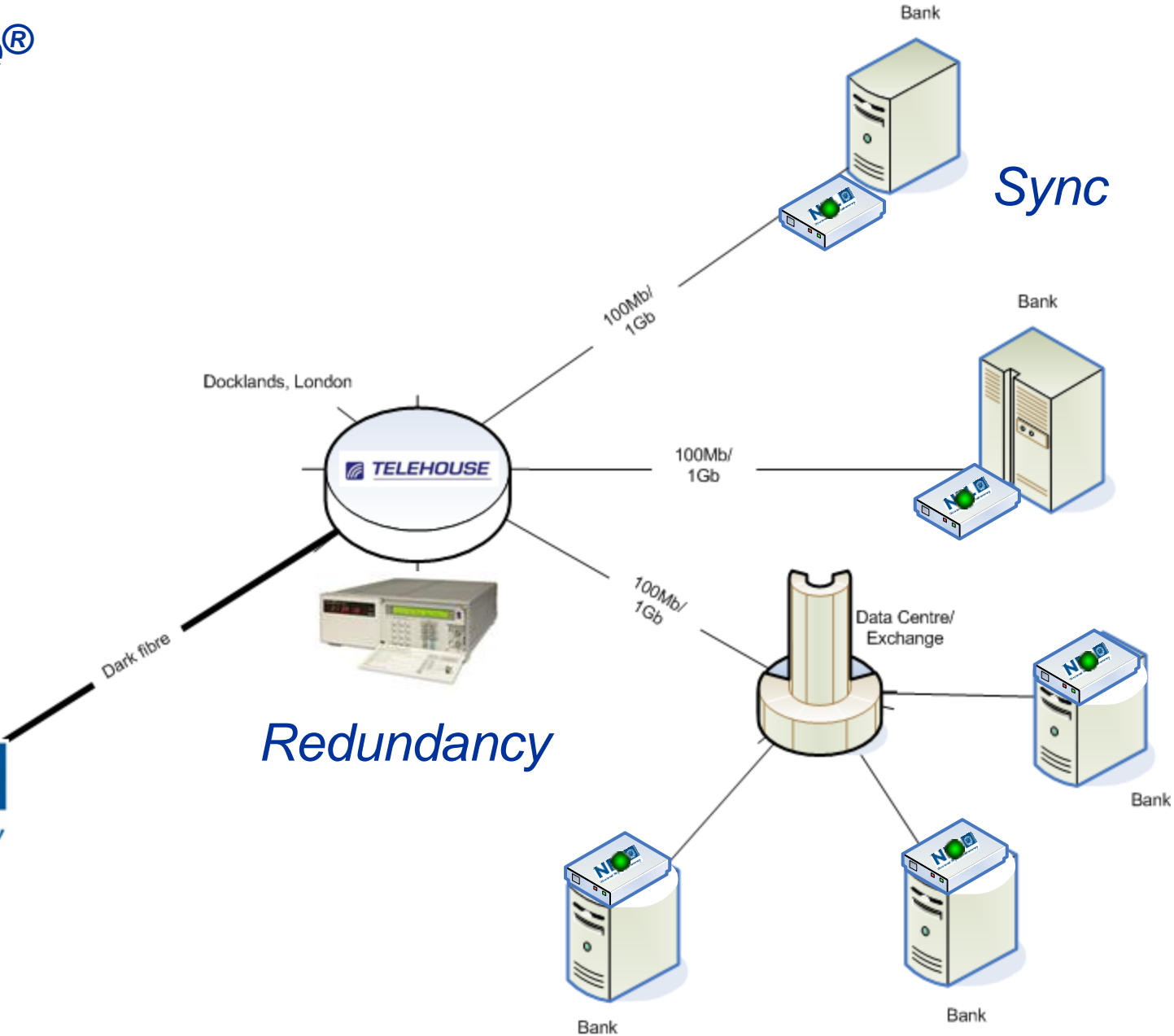
# Timing in the financial sector

- Algorithmic Trading & High Frequency Trading
- Low Latency Trading and colocation
- Arbitrage
- Instrumentation
  - Timestamping
  - Sync systems
  - Flow/Health monitoring
  - Latency monitoring
  - Network Performance
  - Hardware development
  - Best execution algos
- Risk evaluation
- Forensics
  - Order of execution
  - Feed delays
- Tick warehousing
- Regulation
  - MiFID II, Audit, Order Audit Trail System, CAT



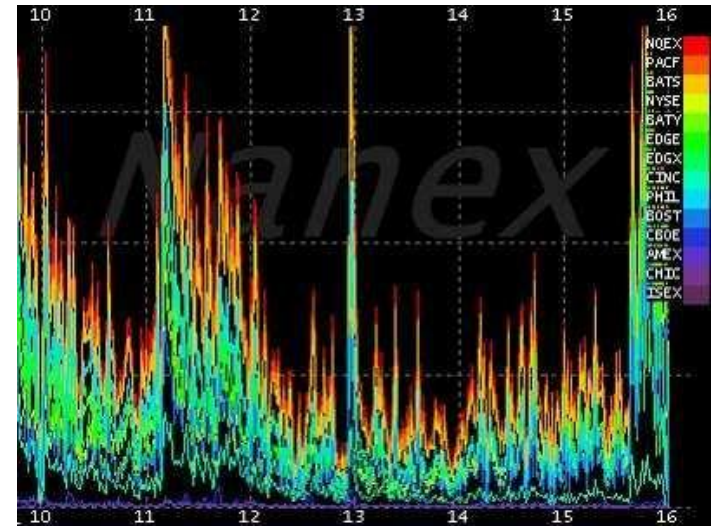
# NPLTime<sup>®</sup>

*Traceable  
Certified  
Resilient*



# Benefits

- Risk mitigation
  - Not affected by solar storms, jamming, spoofing
  - Resilient close loop controlled holdover solution
- Simplicity of implementation
  - Time is consumed, not managed, leap seconds
- Maximises confidence in data timing
  - Ease of audit
  - Ensure accurate data release timing
  - Enhanced forensic and playback capability
- Maximises benefit realisation of localised infrastructure upgrades
  - Provides both absolute time and sync across implementations of PTP
- Eases the requirement internally to achieve compliancy
  - Source (NPLTime) → internal distribution → timestamping engine
  - Lower cost of infrastructure upgrade
- Inherent synchronisation of multi-location implementations
  - NPLTime SLA available at all certified demarcation point
- Eases measurement capability
  - Network optimisation and latency metrics
  - Simplistic  $t_B - t_A$  latency measurements



# ESMA regulation

European Securities and Markets Authority

MiFID II, RTS 36, Consultation Paper, Mar 2015

Markets in Financial Instruments Directive II

- Tiered approach so far, likely to degrade
- Jan 2017 implementation
- Traceability to UTC
- Gateway to gateway latency based
  - Voice trading → 1s to UTC
  - 1ms – 999ms → 1ms to UTC
  - 1 $\mu$ s - 999 $\mu$ s → 1 $\mu$ s to UTC (electronic trading)
  - <1 $\mu$ s → 1ns to UTC!! (colocation and HFT)



European Securities and  
Markets Authority

# Int'l Workshop for Timestamp Traceability

28<sup>th</sup> Oct 2015, Banking Hall, London

## Realisation of a unified common clock at the timestamp



- Provide an overview of time in the financial sector
- Understand international regulatory requirements
- Clarify time traceability to UTC
- Discuss issues faced in achieving traceability
- Assess cost implications of infrastructure upgrades
- Assess the future of computer trading and the traceability requirements
- **International Advisory Group**

# Thank you for listening



Dr Leon Lobo  
National Physical Laboratory  
Hampton Road  
Teddington  
TW11 0LW

<http://www.npl.co.uk/npltime>