

The background of the top section features a dark, abstract architectural structure with sharp angles and shadows. Overlaid on the right side are several large, overlapping chevron shapes pointing to the right, in shades of orange and grey. The Instrumentix logo is positioned in the upper left corner of this section.

instrumentix

xMetrics®

Key Capabilities

xMetrics® is an award-winning, independent, modular, high-performance Trade Flow Analytics & Observability platform. It delivers market-leading transparency, analysis and actionable insight for capital markets firms, with proactive monitoring of the entire trading estate — including the infrastructure on which it runs.

Designed from the ground up for the demands of electronic financial markets, xMetrics provides a single pane of glass to monitor all execution, market data, infrastructure and network performance for any asset class. Written in multi-threaded C++11 for maximum throughput, the platform goes far beyond simple latency measurement — it creates rich business and technology data that can be leveraged for real-time visualisation, alerting, reporting and deep performance analysis.

Purpose-built for financial markets, xMetrics delivers what other platforms cannot: a programmable, composable and distributable trade flow observability architecture designed for the structural realities of capital markets infrastructure.

Only xMetrics allows firms to implement their own analytics logic and metrics, free from the constraints of the vendor roadmap. The result is not vendor-defined monitoring — it is firm-defined intelligence.

xMetrics is the only solution that offers complete topological freedom. A highly distributed environment demands an equally distributed monitoring architecture — xMetrics was designed from the outset on that principle. The result is the only solution that can be used to design a global trade flow analytics deployment that does not immediately get torpedoed by the CTO on architecture, or by the CFO on cost.

xMetrics offers native persistence to the industry-standard datastores that matter, eliminating reliance on external or customer-managed analytics stacks entirely. The result is lower TCO, scalable deployment, compliance-defined data boundaries, and seamless integration with existing systems.

Core Platform Capabilities

- **Complete Multi-Hop Visibility** — Full lifecycle visibility of every order and market data tick, independent of protocol changes, ensuring end-to-end oversight. Designed from the outset to instrument global trading environments, proven across 18+ hops.
- **WAN Performance Monitoring** — Latency, packet loss and traffic measurement — with microburst detection — for both unicast and multicast traffic.
- **Industry-Standard Data Persistence** — All data written to industry-standard datastores (TimeScaleDB, ClickHouse, Elasticsearch) for real-time analysis, ensuring fast query results for any order or tick. External data from other systems can also be consumed and visualised alongside xMetrics data.
- **Adaptive Alerting** — Fully configurable, real-time, multi-factor adaptive alerting — including from derived metrics — easily integrated with internal systems. Alert sinks include email, syslog, Kafka topic and socket.
- **Compliance-Ready Audit Trail** — Decode and persistence of all orders, fills, quotes and ticks, backed by easy-to-use APIs, providing an audit trail suitable for compliance and regulatory use cases, including MiFID II.
- **Flexible Visualisation** — An extremely flexible visualisation framework allows users complete control over dashboard layout, populated from any available datastore. Visualisation of data from external sources is also supported.

- **True Multi-Tenancy** — Rich, fully featured dashboards can be provided on a per-client basis, or users can integrate selected output into their own client portals. Any data created can be used to produce rich, client-specific reports.
- **Mutations Framework** — Powerful data enrichment and transformation via the unique Mutations Framework, allowing user-defined functions (UDFs) in byte-compiled Python to be inserted directly into the instrumentation path. Emerging and future requirements can be tackled with ease.
- **High-Performance Architecture** — Highly modular and scalable, written in multi-threaded C++ — the only programming language appropriate for high-throughput trading environments.
- **Managed Service** — Available as a fully managed service 24x7x365. All components of the xMetrics stack are monitored at all times.

Latency Monitoring

Multi-hop latency monitoring with 1-nanosecond precision, including per-interval summarised statistics across all instrumentation points.

Primary Capabilities

- Multi-hop latency monitoring with 1-ns precision including per-interval summarised statistics
- Per instruction detail and statistical measures
- Latency analysis by client, MIC, symbol etc
- Enrichment with metadata using mutations framework
- Drill-down for outliers with full order lifecycle — easy viewing of each raw event forming each transaction

Session Status Monitoring

Venue-specific heartbeat messaging (e.g. BOE, OUCH, Pillar) is used to expose session health across both client-side (typically FIX) and market-side (non-FIX) connections.

Primary Capabilities

- Use of venue-specific heartbeat messaging to expose session health in real time
- Available for both client-side (typically FIX) and market-side (non-FIX) connections
- xMetrics Sentinel feature allows for bespoke, client-specific implementations

Unicast Traffic Monitoring

Deep visibility into unicast traffic behaviour, including aggregate and per-connection bandwidth measurement, TCP behavioural analysis and enrichment to identify affected client trading sessions.

Primary Capabilities

- Aggregate and per-connection bandwidth measurement
- TCP behavioural analysis (connection): SYN, FIN, RST
- TCP behavioural analysis (health): retransmission, out-of-sequence, zero-window, duplicate ACK
- Enrichment with metadata to show affected client trading sessions
- 1-ms microburst measurement

Order and Algo Search

Standard and custom search dashboards providing highly flexible search capabilities across the full trade flow dataset, with fast results retrieval powered by high-performance datastores.

Primary Capabilities

- Highly flexible search features using any field, with ability to view both individual instructions and order chains
- Fast results retrieval and export powered by high-performance datastores (TimeScaleDB and ClickHouse)
- Periodic and intra-day reports available in several formats
- Additional use cases such as venue mandated obligations

Market Data Monitoring

Comprehensive market data monitoring, including one-way delay measurement between venue and client edge using venue timestamps from the payload, with full gap detection, bandwidth measurement and microburst analysis.

Primary Capabilities

- One-way delay monitoring between venue and client edge using venue timestamp from payload
- All-channel gap detection with full metadata of affected ticks
- Aggregate and per-channel bandwidth measurement
- Microburst measurement (bytes and packets) both in aggregate and per channel

Reporting

Rich reporting capabilities across all data that xMetrics creates, delivered flexibly via multiple channels and formats.

Primary Capabilities

- Rich reports available for any data that xMetrics creates
- Reports delivered via email or made available for download in PDF, HTML, PNG and CSV formats
- Morning status reports, test session results, daily, weekly, monthly client reports, market maker obligations and more
- Clients can consume xMetrics data using a wide variety of industry-standard and custom APIs