

KEYSIGHT PLUS INSTRUMENTIX:

Maximize trade opportunities with real-time infrastructure performance monitoring

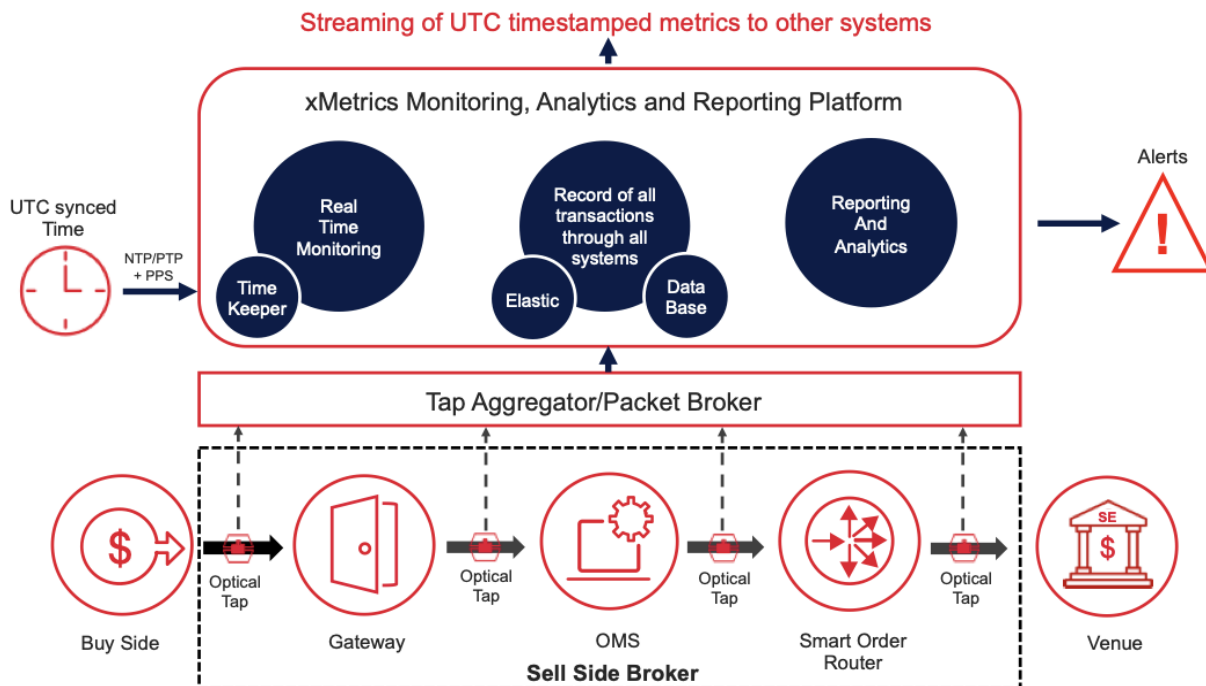
Financial institutions face intense pressure to execute precise, high-quality trades and meet demanding regulatory standards. xMetrics® cutting-edge flow monitoring software from Instrumentix runs within Keysight visibility solutions to provide traders, brokers, and exchanges with real-time insights to make the right decisions at every stage of the trade lifecycle.

Real-time trade infrastructure monitoring and analysis (RTIMA) solutions featuring technology from Keysight and Instrumentix ensure financial institutions capture, decode, and understand network traffic containing orders, trades and market data. Complete solutions include monitoring interactions across trading systems, exchanges, and broker networks to ensure transactions get executed correctly and efficiently.

Integrated solutions deliver unparalleled visibility and control

Integrated solutions enable trading firms, exchanges, and internal IT, network, and compliance teams to achieve secure, scalable RTIMA. Keysight network visibility platforms feature optical taps, network packet brokers (NPBs) or “tap aggregators” that capture, filter and prepare traffic for analysis by monitoring software. xMetrics runs inside Keysight NPBs for seamless visibility and control with minimal latency and operations overhead.

Keysight TimeKeeper synchronizes xMetrics system clocks and gathers statistics shown here:



xMetrics® extends investments in monitoring

Investment banking and venue technologists designed xMetrics flow monitoring software to provide affordable global trading environment instrumentation. Now fully supported by Keysight onboard the Vision 400 (V400) packet broker, xMetrics delivers comprehensive, real-time insight into every stage of the trade life cycle.

With a modular, scalable architecture, xMetrics ensures seamless integration into both new and existing monitoring infrastructures and legacy systems. Deployment flexibility maximizes the value of previous investments while leveraging modern, real-time trade flow instrumentation, visualization, and analytics.

Key features and benefits

- **Monitors all asset-class trading activities** across most exchanges, venues, and asset classes
- **Real-time data capture:** Tracks, stores, and alerts on Ticks, Quotes and Orders for analysis
- **Unparalleled scale** streamlines deployment into complex environments
- **Complete multi-hop visibility** of every transaction independent of protocol changes
- **Faster correlation and root cause analysis** for rapid identification and summarization of issues
- **Real-time alerts** with summaries and per-transaction insights into potential issues
- **Improved forensics** – capture and replay traffic to analyze market or system issues after the fact
- **Integration with preferred solutions** such as ION Marketview, Horizon, and Fidessa
- **Rich metadata** to enrich monitoring and analysis

Use cases

Market Data Monitoring minimizes latency and maximizes throughput to protect and analyze critical market data feeds. xMetrics detects one-way and multi-hop latency, gaps, and microbursts. Combined Keysight/xMetrics solutions provide 1ms traffic sampling, packet loss detection, real-time alerts and metadata for comprehensive visibility coverage.

Application and Network Latency Monitoring: Unlike traditional network tools that only measure latency across flat networks of switches and routers, xMetrics measures true end-to-end trade path latency across complex, multi-hop environments. Intelligent visibility correlates messages across the network, infrastructure, and application tiers to show how each tier affects latency and end-to-end performance:

Order/Algo Search enables users to investigate and understand the progression of orders across the trading infrastructure to find where things went wrong.

Status Monitoring ensures both physical connectivity and application layer logins remain fully operational across network and application layer health monitoring.

TCP Unicast Monitoring facilitates communication from the buy side to the sell side, from the sell side to execution venues, and within internal systems. Deep visibility into TCP/IP performance ensures smooth operations and helps uncover and address network issues before they degrade trading performance.

Compliance: Vision NPBs running Keysight Timekeeper and xMetrics software provide accurate timestamping on a continuous and historic basis. The xMetrics platform provides a fully independent and integrated solution for the capture of all application network and transaction data required for RTS and FINRA reporting, evaluation and storage.

xMetrics Solution Components

xMetrics consists of a range of modular components used to build modern trading infrastructure monitoring and analysis solutions. Components include:

Capture and decoding of real-time network traffic from trading components such as Feed Handlers, Order Management Systems, and Smart Order Routers. The xMetrics protocol stack includes FIX, Fixed Width, Custom/Bespoke, and Hasher.

xMaster correlation engine for monitoring complex, nonlinear relationships, matching decoded events received from the xAgent to create transactional models that track performance across environments.

xReporter summarizes transactions from xMaster over configurable time periods (60 seconds for execution data, 5 seconds for market data, etc.). xReporter aggregates data across multiple dimensions such as gateway, trader, and symbol and generates rich statistics — min, max, mean, median, standard deviation, jitter, and arbitrary percentiles — as well as metrics like message rates and bandwidth.

Network performance measurement delivers metrics related to bandwidth, traffic rates, packet rates, and microbursts and exposes TCP behavior anomalies such as retransmission and zero-window errors helping users identify and resolve performance bottlenecks quickly.

Mutations framework enables powerful data transformation and enrichment from external sources. Aids complex operations like rewriting symbology, mathematical calculations on data fields, and enrichment of fields with metadata.

Long-term storage for all business transactions, summary metrics, network details, and raw decoded events, including ElasticSearch, InfluxDB, Clickhouse and TimescaleDB. Store different types of data for varying durations.

Adaptive alerting covers business data (summaries, transactions, events), network behavior (microbursts, bandwidth, retransmissions), and server health (CPU load, memory, disk utilization).

xMetrics® Genesis framework (based on Grafana) offers multi-tenant visualization with full control over dashboard design. Users view timeseries data and search for specific quotes or orders based on any relevant criteria. A unified, custom view of multiple datasets speeds and enhances analysis.

Built-In Reports & Report Editor lets users create in-depth, custom reports drawing on all available data. Available on Windows, Linux, or Mac desktops.

 **KEYSIGHT**

Keysight Technologies, Inc. (NYSE: KEYS) is a leading technology company that helps enterprises, service providers and governments accelerate innovation to connect and secure the world. Keysight's solutions optimize networks and bring electronic products to market faster and at a lower cost with offerings from design simulation, to prototype validation, to manufacturing test, to optimization in networks and cloud environments. Customers span the worldwide communications ecosystem, aerospace and defense, automotive, energy, semiconductor and general electronics end markets. Keysight generated revenues of \$4.2B in fiscal year 2020. More information is available at www.keysight.com.

 **instrumentix**
the evolution of flow monitoring

Instrumentix is a leader in performance monitoring and analytics for global financial markets. xMetrics®, a unique modular trading infrastructure monitoring and analytics solution, provides an end-to-end, real-time view of some of the world's most complex trading environments. Committed to continuous innovation, Instrumentix ensures market participants receive the actionable insight and transparency needed to optimise execution outcomes, drive business improvement, and comply with regulatory requirements. Instrumentix takes immense pride in partnering with our clients to help them achieve competitive edge. Learn more at www.instrumentix.co.uk

For more information on Keysight visibility products and solutions, visit **www.GetNetworkVisibility.com**.