

TRADEVISION HIGH PERFORMANCE MONITORING OF MULTICAST MARKET DATA FEEDS

DATA SHEET

TRADESTACK + VISION ONE = TRADEVISION

Rapidly detecting degradation in the quality of data feeds is a considerable challenge for any market participants who use or transport real-time market feeds. Market data transport technology is primarily based around the use of multicast, which does not have any error correcting mechanisms at the network layer. This means that any packets containing key trade data that have been lost cannot be detected until they are passed through a feed handler system at the end user site.

This creates several challenges:

- Many feed handlers use feed arbitration (between A and B feeds) to autocorrect message drops, so application teams may neither be aware of problems nor quickly pass-on details to their network operations teams.
- Application teams may be aware of the problem, but the tools they use may not be available to the network operations teams who are responsible for diagnosing and resolving the issue.
- Detecting a problem at the feed handler does not tell you where the problem occurred. Was it a problem with the Exchange or Market Data Vendor's ticker plant? Was it a problem in their internal network? Was there a problem in the third-party network carrier or extranet provider used to transfer the market data? Was there a problem with one or more of the upstream production switches? Was the problem in the end users internal network?

All these questions lead to slow decision-making and long fault repair times that can be measured in days and not minutes. Much of the technology used to monitor this infrastructure today is either not up to the task or involves expensive data capture, storage, and analytic technologies that have remained more or less the same for twenty years. These technologies are expensive, and consume valuable power and real estate within expensive data centers.

HIGHLIGHTS

- **Flexible Deployment Options** because it combines TradeStack market data features with our turnkey Vision ONE network packet broker
- **High Performance Multicast Gap Detection** provides Real-time gap detection of up to 4096 simultaneous multicast channels and 240 million data messages per second
- **Time Stamp Insertion** – Accurate time stamping of all packets and events using PTP based timing.
- **Channel Health.** Monitors channel performance and alerts to anomalies, simplifying feed troubleshooting
- **VLAN tag insertion** for identification of input ports.
- **Exchange Feeds pre-programmed** for easy set up and configuration.
- **Super Reliable.** Not dependent on error prone, expensive servers.



Figure 1 TradeVision™

TRADEVISION SOLVES THESE CHALLENGES

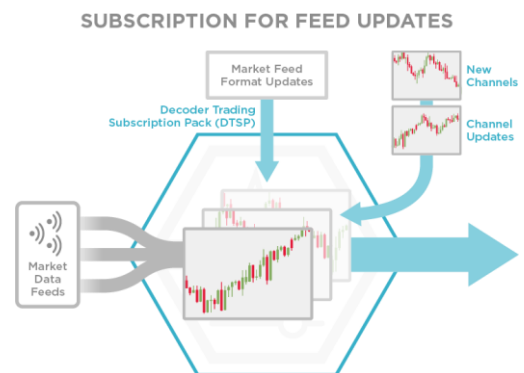
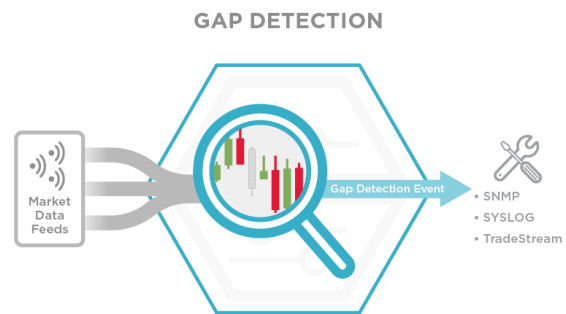
TradeVision is ideally-suited to wide-scale deployments and the cost-conscious customer that is not currently addressed by existing solutions.

TradeVision is a new type of solution that marries together TradeStack features from the proven TradeView platform and our turnkey Vision ONE network packet broker. It provides the ease-of-use Ixia is known for, market data features, and the increased port speeds, enhanced aggregation, and filtering capabilities of the Vision ONE and in a 1U form-factor

Ixia TradeVision delivers high-performance monitoring of market data feeds, instantly detecting multicast sequence gaps or feed failures. It can provide such analysis simultaneously on up to 4 x 40GE communication links or LAN segments. This can be provided at full line rate of 40Gbps without the risk of false 'gap' positives. In addition, TradeVision can detect the absence of market data messages and stream a summary of traffic statistics and gaps to storage devices and management systems. Each TradeVision has the capacity to monitor 240 million trade/quote messages a second, 12 times more than the entire US equities and options markets combined.

KEY FEATURES:

- **Multicast Gap Detection** detects errors in mission critical market data feeds and sends alerts to other tools and systems, so you can quickly recover from market data errors and have correct prices to trade on. Gaps, out of sequence and duplicate packets are rapidly detected and notified to down stream management systems via Syslog or SNMP messages.
- **Feed and Channel Health** detects the lack of traffic on market data feeds so that network operations staff can address without having to wait to be alerted by application IT staff.
- **Microburst detection** detects excessive traffic and sends alerts to other tools and systems, so that network congestion issues can be quickly addressed.
- **Detailed Traffic statistics** streams high resolution traffic statistics off TradeView to Big Data applications such as Splunk. Allows network engineers to build up data on historical traffic patterns and improve capacity planning.
- **Nanosecond Time Stamping** taps the network pipes that carry the electronic trading communications and time stamps the messages directly off the wire using nanosecond resolution time stamping with sub microsecond accuracy to UTC.
- **Pre-programmed Exchange Feed IP addresses** – Populated with over 21,000 Exchange IP address and over 1100 feeds easy set up.
- **Deep packet inspection** classifies traffic in real time and directs it to the correct tool according to parameters such as application type, geolocation, or even handset type—so tools get just the traffic type they need, again optimizing your investment in tool infrastructure.
- **Sophisticated load balancing** distributes traffic across several tools for monitoring in serial or parallel to maximize up-time and ensure that no critical data is lost.
- **Powerful GUI** allows you to focus on market feed data management rather than configuration the industry-leading user interface and patented filter compiler make configuration simple.



- **Drag and Drop Configuration** allows complex scenarios to be rapidly deployed. For example, Multicast traffic can be sent to inbuilt gap detection capabilities, whilst TCP/IP traffic is routed to trade analytics tools.

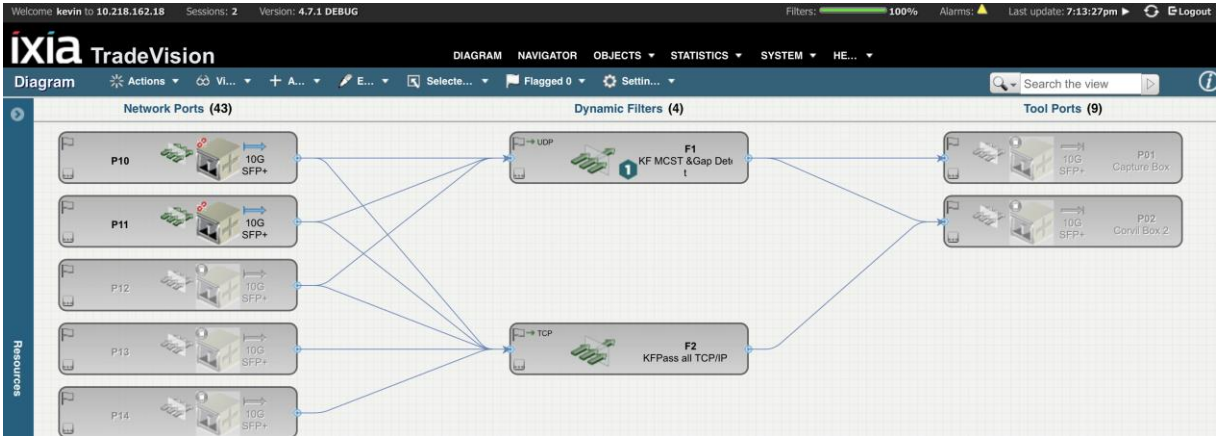


Figure 2 Simple "point-and-click" management

The screenshot shows the 'Edit AE Resource - L1-AE1 (DTSP-8.8.79.1966232500)' dialog box in Ixia TradeVision. The 'Gap Detection' tab is active. It features a 'Select channels for gap detection.' section with a 'Multicast Channel Select' table. The table lists various channels with checkboxes and counts. A 'Channel Count: 233 of 1024' is displayed at the bottom. The background shows the software interface with a 'Resources' list on the left and 'Tool Ports (9)' on the right.

Channel	Count
INDICES	0 of 1
NYSE	1 of 12
BBO	0 of 1
OpenBook Ultra	0 of 6
Options Analysis Feed	0 of 2
XDP BBO	0 of 4
XDP Imbalances	0 of 4
XDP Integrated - Tape A	5 of 6
Production - Line A	4 of 4
233.125.89.24:11064 Publisher - 1	
233.125.89.25:11065 Publisher - 2	
233.125.89.26:11066 Publisher - 3	
233.125.89.27:11067 Publisher - 4	
Production - Line B	0 of 4
TEST - (Playback Testing) Line A	1 of 1
TEST - (Playback Testing) Line B	1 of 1

Figure 3 Simple Pre-populated Channel Selection Process

ixia TradeVision DIAGRAM NAVIGATOR OBJECTS STATISTICS SYSTEM HE...

System Settings Actions + A... Settin...

General

System info:	Not set	Server log level:	Info
IPv4 configuration:	10.218.162.18	Power-on self-test (POST):	Disabled
IPv6 configuration:	Disabled	TLS/HTTPS:	Disabled
Management port settings:	Auto-negotiate	Syslog TLS handshake:	Disabled
Serial Port Access:	Enabled	Timestamp time source:	Local
Console session timeout:	Never	Statistics polling interval:	1 sec
Console log level:	None	TAC SSH:	Disabled
Console login banner:	Reserved for Gorilla Test - ...	TCL API:	Enabled
Web API settings:	Enabled on port 8000	QSFP mode:	QSFP
Tool management view:	Disabled		

Remote Services

Authentication:	Local
Syslog:	Not Set
SNMP:	Disabled
DNS:	Not Set
NTP:	Not set
PTP:	Disabled - Master PTP Addr: 192.168.1.11

Filter Memory Allocation

Network port / Dynamic source IP mix:	25 / 75
Network port filter mix (L2-only / L2+IPv4 / IPv4 only / IPv6):	0 / 100 / 0 / 0
Dynamic source IP filter mix (IPv4 / IPv6):	100 / 0
Dynamic filter mix (L2L3L4Mac / L2L3L4NoMac / Custom offset):	11 / 89 / None
Tool port filter mix (L2-only / L2+IPv4 / IPv4 only / IPv6):	0 / 100 / 0 / 0

Tool Port Group Load Balance Settings

IPv4 packets:	Src/Dst IPv4 + IP Protocol + Src/Dst Ports
IPv6 packets:	Src/Dst IPv6 + Next Header + Src/Dst Ports
MPLS packets:	NONE
L2 packets:	Src/Dst MAC

Figure 4 Robust System Settings

PRODUCT CAPABILITIES

TRADESTACK CAPABILITIES

- Gap Detection Analysis Bandwidth: 160 Gbps
- Port Speed: 48x10GE + 4x40GE (Standard license includes 40x10GE + 4x40GE)
- Time stamp insertion – standard trailer – sub 1u Sec accuracy to UTC via PTP
- ‘Events’ timed to sub 1uSec accuracy to UTC via PTP
- Aggregate Maximum of Multicast Feed Channels Monitored: 4096
- Maximum Data Rate of Monitored Messages per Port: 60 M messages / second
- Aggregate Maximum Messages Monitored: 240 M messages / second
- Event Reporting: TradeStream, Syslog and SNMP
- Meta Data Streaming: Gap Alerts and Traffic Statistics
- Supported Feeds**: Over 200 feeds are supported, including Alpha, AQUIS, ASX24, BATS BYX and BZX Equities, BZX Options, BATS CBOE, CBOT, CFE, ChiX Canada, Chi-X Europe, BM&F Bovespa, Borsa Italiana (Main and TAH), CME (BM&F, BMD, COMEX, CTA, DME, Green Exchange, Hong Kong Exchange(Orion), JSE, KCBT, KOSPI, KOSDAQ, KRX, MICEX, MexDer, NYMEX) Edge A, Edge X, Eurex, Euronext Cash Markets, ICE, ISE, LSE, MICEX, NASDAQ OMX, NLX, NYSE, OPRA, OTC, SIX, STRIKE Microwave Network, TMX, TMXV, TMX Select, Tokyo Stock Exchange, Turquoise, UTP, and Xetra.

Check with your Ixia sales representative or www.ixiacom.com for the latest list of supported feeds.

NETSTACK (Packet Broker) CAPABILITIES

- Filtering at port ingress, egress and within Dynamic Filters
- Filter by Layer 2, Layer 3, Layer 4 and VLANs
- Non-blocking architecture
- Pass All, Pass by Criteria, Deny All, and Deny by Criteria filtering
- IPV4 and IPV6 support
- Port Traffic Statistics and Utilization
- VLAN Tagging support
- Transceiver status information
- Port and Filter Naming
- Port Groups
- NTP and PTP support

APPSTACK (ATIP) CAPABILITIES

- Improves visibility solutions through highly accurate application identification
- Simple point-and-click management interface allows operators to simply select application traffic types of interest
- Filter application traffic to tools or enhance data provided to tools with enhanced NetFlow
- Greatly improves monitoring platforms by adding a much richer set of geographical, application and device information
- Application signatures are managed and maintained by Ixia, allowing tools to expand awareness automatically as new applications come online
- Performs DPI to identify traffic per:
 - Application, geography, device information, and service provider
 - Application signatures are regularly updated via ATI subscription
- Regular expression matching
- Multiple actions can be taken on matching sessions
 - Forward all related packets to an analysis tool
 - Enhanced NetFlow v9 and v10 and IPFIX can be generated and sent to up to 10 collectors

SPECIFICATIONS

GENERAL SPECIFICATIONS	
<p>Performance</p> <ul style="list-style-type: none"> • 1U Market Data Network Packet Broker • Full line rate across all ports with blocking enabled • Reporting, blocking, or fail-safe bypass operation • Heat/power dissipation for module at 100% traffic load: 660W / 2252 BTU/hour 	<p>Management</p> <ul style="list-style-type: none"> • SNMP v1, v2, v3 support • Supports IEEE / Precision Time Protocol (PTP) time synchronization • Local, RADIUS, and TACACS+ support (members and groups) • Granular access control features - RBAC • Event monitoring and logging • Syslog Export • IT Automation control with RESTful API

PHYSICAL SPECIFICATIONS	
<p>Ixia Vision ONE Size, Weight and Compliance</p> <ul style="list-style-type: none"> • 1RU high 19" rack-mountable chassis • Dimensions: 17.5W x 29.5L x 1.75H (inches) / 44.5W x 75.0L x 4.5H (cm) • Weight: 36.4lb / 16.5kg • ROHS • IEC-60950-1:2005, UL60950-1, and CSA C22.2 No. 60950-1, EN 60950-1, CE, FCC, AS/NZS CISPR 22 & 24, 55022, 55024, IEC-003 	<p>Power for Ixia TradeVision (AC)</p> <ul style="list-style-type: none"> • Hot swappable - AC power supplies • Nom. current: 6.6A@100VAC, 2.75A@240VAC • Max. operating input current: 7.7A@100VAC • Max. operating input current: 3.2A@240VAC <p>Power for Ixia TradeVision (DC)</p> <ul style="list-style-type: none"> • Hot swappable - Dual AC power supplies • Operating input voltage: 40 to 60VDC • Nom. current: 12.5A @ 53VDC • Max. operating input current: 19.25A @ 40VDC

OPERATING SPECIFICATIONS	
<p>Temperature</p> <ul style="list-style-type: none"> • Operating: 5°C to 40°C • Short-term*: -5°C to 55°C (*not to exceed 96 consecutive hours) • Short-term* with fan failure: -5°C to 40°C (*not to exceed 96 consecutive hours) 	<p>Humidity</p> <ul style="list-style-type: none"> • Operating: 5% to 85% (non-condensing) • Short-term*: 5% to 90% (non-condensing, *not to exceed 96 hours)

ORDERING INFORMATION

Solution Ordering Information

Solutions include Ixia TradeVision hardware with 48 physical SFP/SFP+ ports and 4 QSFP+ ports. Transceivers are not included. Compatible transceivers are available and may be purchased from Ixia. All solutions are configured with dual power supplies. Additional licenses may be added to a system to enable additional ports, TradeStack market features, AppStack, or SecureStack features.

IXIA TRADEVISION BASE UNIT		NUMBER OF PHYSICAL PORTS		LICENSED PORTS		
SOLUTION PART NUMBER	1/10G HW PORTS INCLUDED	40G HW PORTS INCLUDED	PORTS LICENSED FOR 1G USE	PORTS LICENSED FOR 10G USE	PORTS LICENSED FOR 40G USE	
SYS-TV	48	4	48	48	4	

License Ordering Information

Software licenses can be added to any of the Ixia Vision ONE hardware components or solutions. A fully licensed chassis supports 48 ports of 1G/10G, 4 ports of 40G, and AppStack.

IXIA TRADEVISION	
COMPONENT PART NUMBER	DESCRIPTION
SYS-TV	Ixia TradeVision - Vision ONE System AC power with (4) 40G and 48 (1/10G) ports enabled plus TradeStack capabilities. (991-0124)

TRADESTACK – MARKET DATA FEATURES	
LICENSE	DESCRIPTION
SUB-TV-TS	Ixia TradeVision, initial (first-year) annual subscription for TradeStack capabilities - decoders required for multicast gap detection and feed health. (993-0122)
909-5027	IXIA Renewal of annual subscription to the TradeStack decoders required from multicast gap detection and feed health (909-5027)

IXIA APPSTACK* (ATIP) HARDWARE ENABLEMENT LICENSES	
COMPONENT PART NUMBER	DESCRIPTION
LIC-V1-SSAS-E	Ixia Vision ONE hardware enablement license for SecureStack (Passive SSL Decryption) and AppStack (ATIP) at entry-level performance - QTY (1) (993-0101)
LIC-V1-SSAS-F	Ixia Vision ONE hardware enablement license for SecureStack (Passive SSL Decryption) and AppStack (ATIP) at full performance - QTY (1) (993-0102)
LIC-V1-SSAS-U	Ixia Vision ONE hardware enablement upgrade license to enable SecureStack (Passive SSL Decryption) and AppStack (ATIP) capabilities (from entry-level to full performance) - QTY (1). Requires additional licenses for features. (993-0104)

IXIA APPSTACK* (ATIP) SUBSCRIPTION LICENSES	
COMPONENT PART NUMBER	Description
SUB-V1-SSAS	Ixia Vision ONE subscription of one-year SecureStack (Passive SSL Decryption) and AppStack (ATIP) license. Includes Passive SSL Decryption and all AppStack features, including the ATI Subscription. (993-0113)
909-5018	Ixia AppStack (ATIP) + SecureStack - renewal of one-year Subscription License. (909-5018)
SUB-V1-APTL	Ixia Vision ONE AppStack (ATIP) one-year subscription license. Includes Application Identification & Filtering, Geolocation & tagging, Application and Threat Intelligence (ATI) data feed - QTY (1) (993-0112)
909-5019	Ixia Vision ONE AppStack (ATIP) renewal license for SUB-V1-APTL. Includes Application Identification & Filtering, Geolocation & tagging, Application and Threat Intelligence (ATI) data feed - QTY (1). (909-5019)
LIC-V1-NTFL	Ixia Vision ONE PacketStack - NetFlow feature license - QTY (1) (993-0109)
LIC-V1-PSSL	Ixia Vision ONE SecureStack - Passive SSL Decryption feature license - QTY (1) (993-0110)

** Note: this V1 feature set is the same license qualified for use with TradeVision, a separate part number is not required.*

Learn more at: www.ixiacom.com

For more information on Ixia products, applications, or services,
please contact your local Ixia or Keysight Technologies office.

The complete list is available at: www.ixiacom.com/contact/info