

### HIGHLIGHTS

- End-to-end high precision, low-latency measurement management solution that characterizes and measures microsecond-level latency and message loss information
- Complete turnkey solution with professional installation service provided
- Support of NTP and GPS based synchronization
- Support for many market data and feeder delivery protocols
- All deployed Ethernet data rates are supported including 10/100 MbE, GbE and 10 GbE

### BENEFITS

- Monitor and capture all network data (fully inclusive of all frames!) over extended periods of time – days, weeks, and even months
- Visualize and resolve network latency and message loss issues accurately and quickly
- Generate alarms and notifications to users and systems management packages when latency threshold levels are breached and/or when message loss is detected
- Ensure that latency and message loss service levels are being met
- Visual drill-downs coupled with traditional packet decode and analysis allow you to home in on problem areas more accurately and quickly

### Introduction

From a recognized leader in network monitoring and application analysis, ClearSight Cronos™ is a new high precision, low-latency monitoring, analysis and reporting management system that is designed to meet the stringent requirements of low-latency dependent applications and systems. Most traditional network monitoring tools (e.g. Sniffers) cannot provide the high-precision capabilities for clocking across multiple probes necessary to effectively detect the microsecond latency levels that affect many time-sensitive applications – particularly those deployed in financial trading and streaming media environments.

ClearSight's new Cronos solutions (see *Figure 1*) provide the ability to cooperate with internet or LAN-based NTP (Network Time Protocol) servers to ensure that all probes share a common clock. Cronos also provides optional support for clock acquisition through GPS antennas and receivers. Customers choosing this option will have the most accurate method of synchronizing Cronos probes (microseconds).

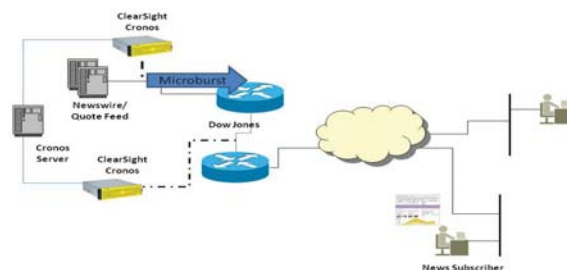


Figure 1: Cronos Probe

This precision clocking capability is the cornerstone for the comprehensive set of features that allow Cronos to provide the end-to-end high precision, low-latency measurement management solution that characterizes and measures microsecond-level latency and message loss information over long periods of time. Each Cronos probe can be outfitted with up to 44 TBs of RAID-enabled storage, allowing the probe to capture and store massive amounts of network data over extended periods of time.

## Network Latency

The Cronos Server calculates the latency for corresponding network data traveling from one endpoint (such as a financial market data feeder) to a second endpoint (such as a subscriber to that feeder).

Figure 2 shows each of the three Latency related panes provided for by Cronos. The top pane displays an aggregated Latency Trend graph for all the flows monitored in a user specified time range. There are three lines representing the aggregate Latency values: Max, Mean and Min.

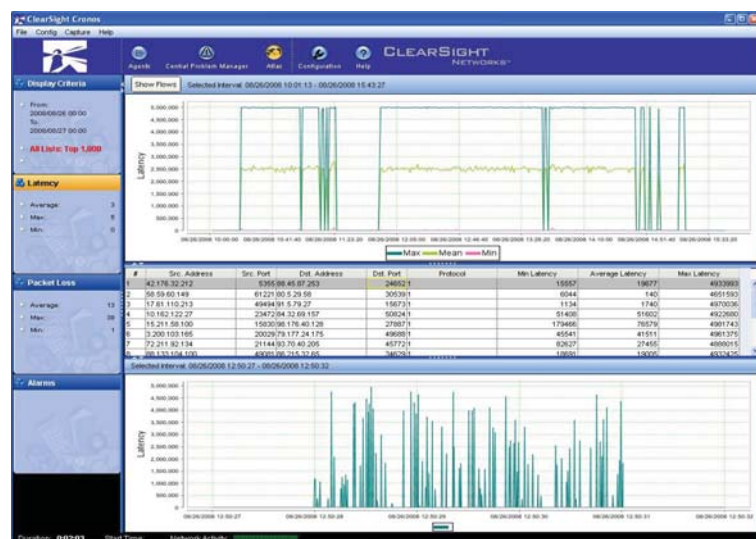


Figure 2: Latency Display

## Message Loss

It is often necessary to appreciate in networks that carry UDP traffic (sent using unicast or multi-cast) you must monitor and measure packet or message loss. Similar to the manner in which latency information is monitored, measured and presented, Cronos provides a visual context to monitor and characterize this information.

## Alarms

Cronos can generate alarms and notifications to users and systems management packages when latency threshold levels are breached and/or when message loss is detected. These levels can be set and fine-tuned to individual network environments. For example, in automated financial trading environments, when Cronos detects unacceptable latency, Cronos would send an alert to halt the trading systems -- instead of allowing the systems to make trading decisions based on old data and placing a vast quantity of money at risk. Just this single

example should provide the necessary ROI supporting reason to why Cronos should be deployed in environments where business decisions are made with time-sensitive information.

Modern financial markets and businesses require the ability to receive information, assimilate it, make appropriate decisions, and in many cases place trades or conduct other business activities, all within a few milliseconds.

As a critical part of this process, you must not only receive the information, but you must know exactly how old it is. The right decision based on old data becomes the wrong decision, and can be disastrous. ClearSight Cronos provides an effective solution (and currently the only solution) to this critical need for microsecond accuracy regarding end-to-end latency. Using this information, you can modify your electronic decision making process to gain a significant edge over your competition.

Additionally, you can use this combination of high-precision latency measurements and packet loss detection, to locate bottlenecks in your network and take steps to minimize latency and eliminate information loss. ClearSight's expert support staff will help you take the steps you need to optimize your network and gain a still further edge over your competition.

## Product Specifications

### GPS Clock Support

CLOCK ACCURACY	200 micro seconds
UPDATE INTERVAL	500 milli-second to PC system clock and Network adapter's on-board timer chip
TYPE OF ANTENNA	Remote powered GPS antenna/ converter unit, up to 300m distance to antenna with RG58 and up to 700m distance with RG213 cable

### NTP Server Support

CLOCK ACCURACY	1 milli-seconds
UPDATE INTERVAL	500 milli-second to PC system clock and Network adapter's on-board timer chip

### Configuration

CRONOS PROBE PAIRS	up to 10
ALARM TYPE	Latency and Packet Loss
ALARM ACTIONS	Email, pager, JavaScript and SNMP

### Financial Protocols Support

BUILD-IN	UQDF, UTDF, CTS, ENF, NIDS, NOIS, MFDS, BTDS, NLS-M, TDDS, BBDS, CQS, ABE, NBQP
CUSTOMIZATION	Define new protocols in XML configuration file

### Latency Measurement And Management

SEGMENT STATISTIC	1 second resolution. Minimum, maximum and average packet loss numbers for all the financial flows in the segment
FLOW STATISTIC	1 second resolution. Minimum, maximum, average packet loss numbers and sequence numbers for the financial flow
ALARM	Generate a new alarm when the number of packet loss is above the threshold during a sampling interval

### Packet/Message Loss Measurement And Management

SEGMENT STATISTIC	1 second resolution. Minimum, maximum and average packet loss numbers for all the financial flows in the segment
FLOW STATISTIC	1 second resolution. Minimum, maximum, average packet loss numbers and sequence numbers for the financial flow
ALARM	Generate a new alarm when the number of packet loss is above the threshold during a sampling interval



46401 Landing Parkway  
Fremont, CA 94538-6496

For more information, call or email us:  
Telephone (US Toll Free): 1-800-825-7563  
Telephone (International): +1-510-824-6000  
Fax: 1-510-824-6100  
Email: [sales@clearsightnet.com](mailto:sales@clearsightnet.com)  
[www.clearsightnet.com](http://www.clearsightnet.com)