Iris®

ADVANCED VIDEO ANALYTICS

As service providers expand their lineups and introduce new channels, utilizing bandwidth efficiently becomes increasingly important to maintain cost-effective operations. At the same time, ensuring consistent video quality on each channel remains essential to maintaining viewer satisfaction. When multiple MPEG-2 and MPEG-4 AVC channels are delivered within a statmux (statistical multiplex) pool, service providers must have the means to monitor, analyze, reorder and balance the channels optimally across these pools to ensure the best use of bandwidth and highest video quality.

The Harmonic Iris® advanced video analytics software suite meets this demand, providing video quality, global channel availability and source profiling measurements for hundreds of compressed channels, both in real time and historically for up to one year. It works in tandem with the Harmonic NMX™ Digital Service Manager video network management system to collect data from Harmonic Electra™ broadcast encoders and present it as a comprehensive set of user-friendly charts, reports and dashboards. As a result, service providers can monitor and analyze their sources and programming over time; achieve better statmux pool balancing, bitrate allocation and homogeneity of video quality; and ultimately increase viewer satisfaction.

Iris takes advantage of the latest in reporting technology to put crucial information at the operator's fingertips. Handling any codec and any format, the high-density solution can simultaneously monitor up to 250 services, reducing CAPEX and OPEX. With monitoring and analysis based on predefined templates, the application can generate reports for executives as well as headend managers, either on-demand or on a per-schedule basis. These reports not only facilitate the identification of — and quick response to — service video-quality issues, but also help service providers log service interruptions and video artifacts to more easily enforce video quality contracts with content providers.

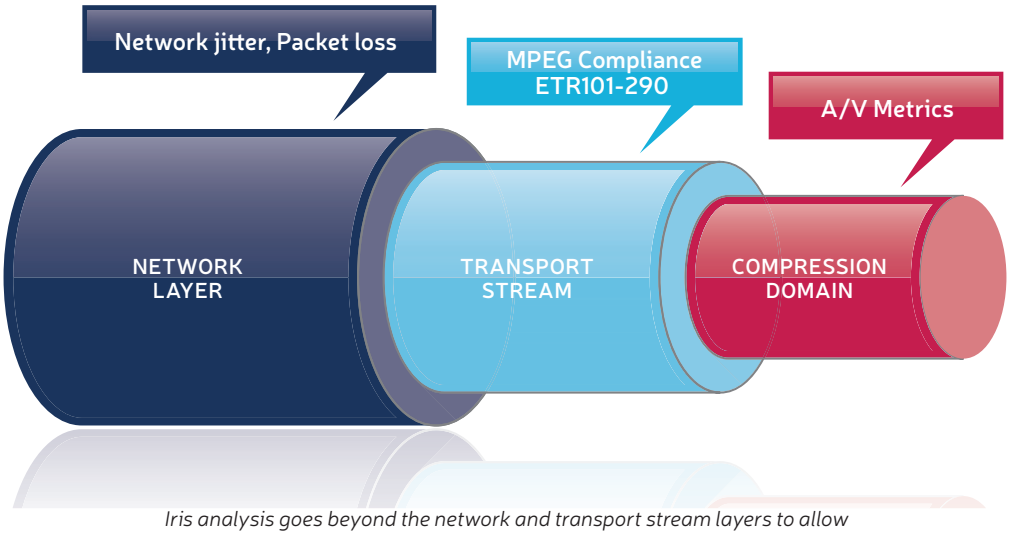
Applications & Use Cases:

- Initial tune-up of new channels
- Finding optimal pool allocation (improving video quality at a given bandwidth)
- Assessing the marginal video quality degradation associated with adding another channel to a pool
- Finding the marginal video quality degradation per reduction of x bandwidth per channel
- Comparing CBR and VBR channel configurations

HIGHLIGHTS

- Source profiling for better identification of channel complexity and bit requirements
- Reporting of statmux pool load factor for optimization of channel allocation
- Real-time and historical analysis of video quality
- Codec independence for flexible source and signal handling
- Scalable configuration of up to 250 channels per 1 RU
- Scheduled reporting and critical event notification

What Makes Iris Unique?



Iris analysis goes beyond the network and transport stream layers to allow users to monitor metrics within the compressed domain.

Source Profiling

Channel complexity varies across time. Elements such as fast motion, highly detailed images, transitions, video noise or poor source quality can all increase the complexity of the channel — and a channel that may be easy to compress during a particular program might become quite complex during another. The more complex the channel, the more bits the encoder will allot to compress each picture.

Iris profiles the sources of the entire lineup by aggregating information on source complexity, quality and availability. The system logs individual channels to assess frame-by-frame complexity over a given amount of time. As a result, users can compare days or weeks to identify recurring patterns and then make adjustments, as necessary.

Statmux Pool Load Factor

Harmonic DiviTrackIP™ technology works with Harmonic Electra encoders and ProStream™ stream processors to enable statmuxing in a LAN or distributed WAN environment. Iris monitors the DiviTrackIP system to help operators define optimal statmux pool allocations, determining pool load factor (PLF) as a function of channel compression complexity, codec and bitrate. Derived from a summation of the individual channel complexities, the PLF can be used to compare pools across a system and the encoding strain — and degree of compression — required to deliver video within the pool's bitrate limitations. With this information, the service provider can better balance channels across multiple pools, and thereby modify compression rates to achieve best video quality.

Video Quality Absolute Degradation (VQAD)

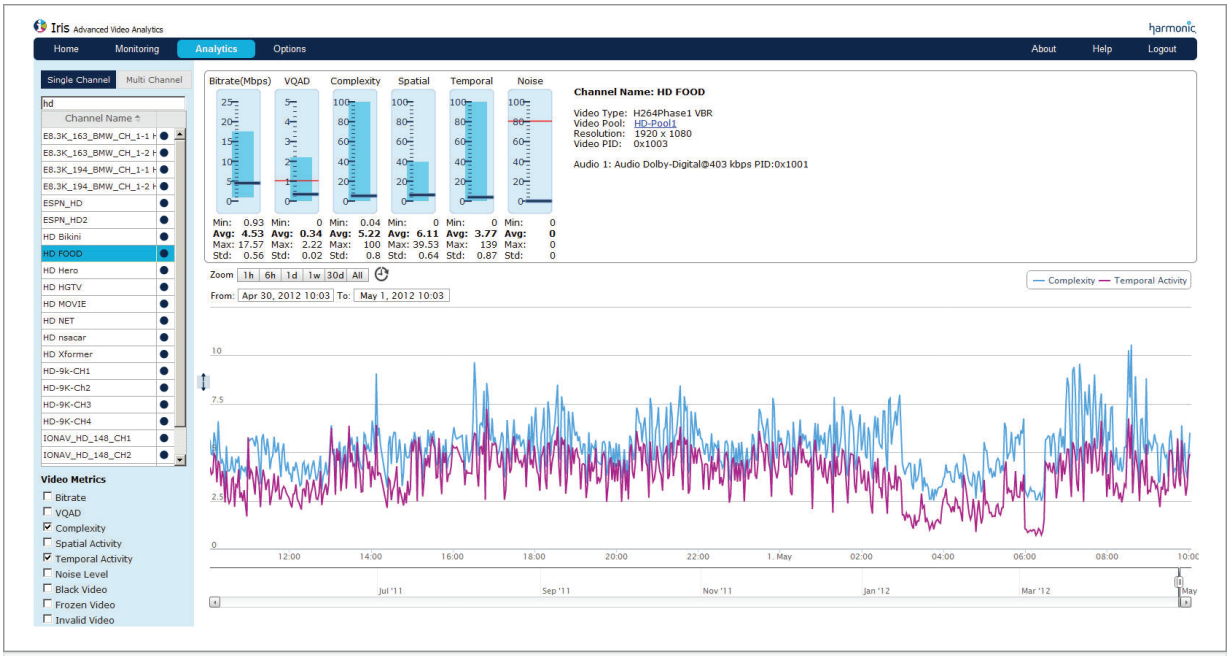
By measuring the quantization of compression, Iris can report the actual degradation of video quality on channels or pools of choice. This VQAD score is based on the decisions made by the encoder, taking into consideration careful calibration based on Harmonic's understanding of human visual systems. Operators can correlate this data with other metrics, such as source complexity or noise, to see how much the output video has degraded in comparison with the source, and then take corrective actions, such as optimizing video quality for a given bitrate or adjusting the bitrate to achieve a predefined video quality.

Simplified QoS

Iris is hosted on a 1-RU server and can be operational in a matter of minutes — installation is completely non-disruptive to NMX, encoders and all other components in the video delivery system. Once online, service lineups are downloaded and synchronized from NMX, and data collection is instant. Using Iris' intuitive, web-based graphical user interface, operators can monitor their entire lineup behavior and video quality in real time, from anywhere with a network connection. Iris thus makes it easier to respond quickly to quality-of-service issues and achieve superior video quality at any given bitrate.

World-Class Service and Support

Harmonic stands behind Iris — and all of its products — with comprehensive service and support programs, including system design, service deployment, technical support and network maintenance. Available options range from professional services for analyzing Iris data to hands-on system training at customer premises, and from full system configuration to 24/7/365 remote troubleshooting. With world-class service plans and a global network of local support professionals, Harmonic offers a flexible and responsive service and support team dedicated to maintaining outstanding "anytime, anywhere" viewer experiences.



Iris profiles and logs a complete set of source-content metrics, allowing users to identify recurring patterns over the course of a full year.

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VIDEO QUALITY METRICS

Channels	Complexity Bitrate Spatial activity Temporal activity Noise Video Quality Absolute Degradation (VQAD) Black frames Freeze frames Lost frames Audio events DPI events
Pools	Bitrate Pool Load Factor (PLF) VQAD

REPORTS

Capabilities	Report Scheduling
Report Formats	PDF, HTML, CSV/Excel
Available Reports	Top/bottom channels Top/bottom pools Channel details Pool details

DEVICE SUPPORT

Harmonic Broadcast Encoders	Electra 9200 Electra 8100 & 8200

DATA IMPORT/EXPORT & PUBLISHING

Import/Export Record Parameters	Date range Channels Pools NMX source
Capabilities	Database backup & restore

STORAGE & CAPACITY

Data Resolution	VQ per second: up to last 24 hours VQ per minute: up to 30 days VQ per hour: up to one year
Maximum Active Channel Count	250

DISCOVERY

Multicast IP Range	Auto discovery of Iris protocol multicasts by IP range
Unicast IP Range	Unicast listening on dedicated Iris ports [6500…6504]
NMX Data	Multiple NMX servers sync to fetch the following: Channel list Channel properties Pool list Pool properties

NETWORKING

Connections	
Management Interface	RJ45, 1000BaseT
Iris Primary Data Interface	RJ45, 1000BaseT
Iris Backup Data Interface	RJ45, 1000BaseT
Protocols	
Channel Metrics	Unicast UDP Multicast UDP, ports 6501:6504 IGMP v2/v3
Alarm Trap Forwarding	SNMP v1,v2, port 161 RFC1157,3417
Application Web Interface	HTTP port 80
Iris<->NMX	WCF protocol
Web Browser	Google Chrome

POWER

Total Input Power	253.3 W 802.9 btu/hr
Total Input Current	1.1 A

REGULATORY & ENVIRONMENTAL

Cooling	Standard redundant
Operating Temperature	+10º to +35º F
Storage Temperature	-4º to +176º F -20º to +80º C
Operating Humidity	< 95% non-condensing 10-80%
Acoustics	Idle: LwA-UL**=5.3 bels, LpAm**=37 dBA
Airflow Rate	8.6 l/s, 18.2 CFM
Electromagnetic Compliance	CE Class A, FCC Class A, VCCI Class A, ICES Class A
Product Materials	EU RoHS, EU REACH, China RoHS
Product Safety	CE, NRTL, SCC, IECEE CB, TUV

PHYSICAL

Dimensions (W x H x D)	19 in x 1.68 in x 30.4 in (1 RU) 48.24 cm x 4.26 cm x 77.2 cm
Weight	40 lbs/18 kg