TAG VIDEO SYSTEMS

REALTIME MEDIA PLATFORM

REALTIME MONITORING, MULTIVIEWING & ANALYTICS SOLUTION

Reduce workflow complexity | **Enable agility, flexibility and change** | **Align your workflow to your business**

TAG Realtime Media Platform

The **TAG Realtime Media Platform** is a 100% software solution running on COTS and cloud, enabling media operations to monitor and analyze video, audio and metadata content across all IP media workflows and deliver high quality at scale.

TAG's unique Zero Friction® approach provides an agile, proven and highly interoperable platform, with two main components:

TAG **Multi Channel Monitoring (MCM)** solution is a comprehensive, integrated monitoring & visualization processing engine for video workflows. The solution inspects live and recorded video feeds, as well as audio, metadata, and all other critical data, allowing users to quickly identify and resolve issues by generating alarms and an advanced multiviewer display.

TAG **Media Control System (MCS)** is a monitoring management layer that allows users to control, manage and configure large monitoring operations, as well as drive multiple MCMs from one access point. It provides users with customizable dashboards, centralized API access, and aggregated monitoring data from across the entire workflow. MCS seamlessly integrates with open-source data analysis tools like Kibana, Grafana and Kafka to provide invaluable operational insight.

Multichannel Monitoring (MCM) Featured Highlights

Monitoring | Probing

Fully-integrated probing and monitoring | Receive-Monitor-Visualize all broadcast media formats | Error-detection, Alerting, Multiviewing tools | Mosaic outputs in HD / UHD video streams encoded/transmitted as ST 2110-20, 2022-6, standard h.264 / h.265 SPTS / MPTS and JPEG-XS over Zixi and SRT protocols and parallel HLS output enable remote multiviewing, mobile device access and flexible installation topology | Monitoring includes the full TR-101-290 suite and hundres of othe points of interest in content, encoding, transport and metadata

Visualization | Multiviewer

Fully-integrated multiviewing tool | Advanced Layout Editor | User-defined, flexible layouts (up to 100 tiles / layout) | Mix / Match uncompressed and compressed signals | ST 2110 Ultra-low latency combined with high input / output density per server | Full Tally / UMD integration | JPEG-XS inputs for cloud-enabled / large-scale monitoring | Built-in redundancy for ST 2022-7 inputs / outputs (two separate NIC deployments)

Realtime Decryption

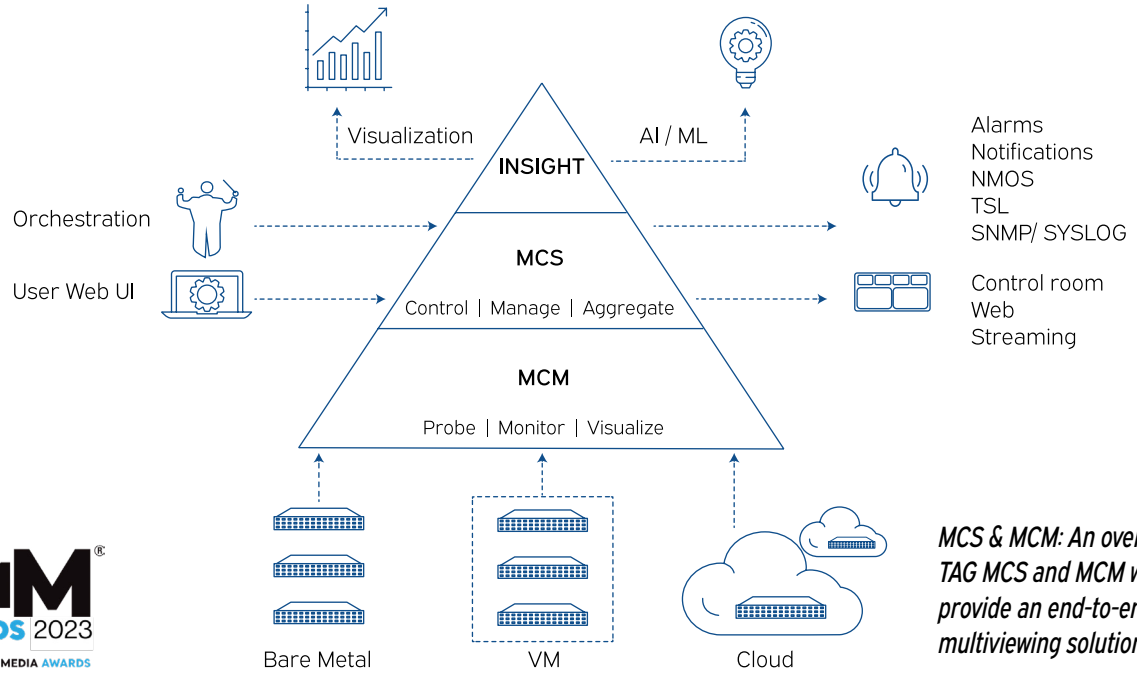
Proven and secure method of real-time Decryption, Monitoring and Viewing of encrypted content provides full monitoring and visualization. Utilizing a direct and secure relationship with the encryption key management server, the MCM fully decodes, monitors and displays the content seamlessly, enabling assurance that the protected content is being delivered reliably throughout the ecosystem.

Smart Recording (Streams, OTT)

Performs a continuous background recording on each source, enabling full-event recording of an error condition. When an error occurs, the MCM uses the pre-event recording and combines it with a recording of the event duration with a post-event tail to provide a full view of the event occurrence. This recording can be delivered to external storage for later review.

Proven Interoperable

Certifications for interoperability and compliance with specific standards such as JT-NM testing for SMPTE ST-2110; AMWA; NMOS, TR-1001-1 among others.



MCS & MCM: An overview of how the TAG MCS and MCM work together to provide an end-to-end monitoring & multiviewing solution

Media Control System (MCS) Featured Highlights

Content Matching (NEW!)

Content confirmation from transmission to delivery | Error detection | Video Drift - Audio Sync | Complementary to SCTE and Decryption functions

Penalty Box

Centralized Error Display | Unlimited Independent Penalty Boxes | Penalty Box placements in any layout

Resource-Optimizing Adaptive Monitoring

Reduce server resource utilization up to 80%
No compromise in monitoring coverage or depth

Big Data Aggregation

Realtime data from MCM instances/channels | Data utilization with IT visualization tools, AI/ML applications | Data aggregation/user access in Elastic Search dBase (real-time, retrospective)

Resilliant Operation

MCS deployment with full-redundancy | Guarantee Resilient operations of all system services

End-to-end Path Awareness

Complete visibility of all sources and combined with Content Matching, the MCS can correlate end-to-end monitoring of any program chain or distribution. Multiple endpoint formats for OTT applications including decryption are supported.

Complete System Management

Full monitoring of all individual MCM instances | Ensure operational health and robustness from one MCS instance | Provides fault tolerance, maximize availability of total system

Deploy in Any Compute Environment

Operational in user IT datacenter environments on bare metal, VM, and cloud instances.

ZerO Friction® Licensing

- One license, any function, zero obsolescence
- USB and cloud licensing mechanisms
- Fully floating and agile licenses
- Dynamic license sharing across hardware, VM and cloud
- CapEx, OpEx subscription and on-demand licensing with blended usage

Workflows

- **Live Production**
  Address the new IP standards and provide features the industry relies on such as ultra-low latency, Tally/ UMD/Control support.
- **Playout**
  monitor a large number of TV channels in the workflow chain at both inputs and outputs.
- **Traditional Delivery & OTT**
  based on common digital distribution standards, which play a key role in fueling the digital multi-channel universe.

TAG Solution Specifications

Monitoring

- **Uncompressed:** ST 2022-6, ST 2110 with AMWA NMOS IS-04, IS-05
- **Video codecs:** MPEG2, H.264 (MPEG4), H.265 (HEVC), JPEG2000, JPEG XS, NDI
- **Resolutions:** SD, HD 720 & 1080, UHD
- **Frame rates:** 23.97, 24, 25, 50, 59.94, 60
- **Audio codecs:** PCM, AES 67, MPEG2, HE-AAC, A52, AAC (AC3, E-AC3), Dolby E, Dolby Atmos
- **Metadata:** AFD, HDR, SCTE 35/104, subtitles, captions
- **Transport:** MP2TS ST 2022-2 and ST 2022-3, RTP, RTMP push and pull, CDI (AWS), unicast and multicast
- **Internet/cloud transport:** Zixi, SRT
- **Failover:** ST 2022-7 seamless switching on uncompressed and TS
- **OTT:** HLS, MPEG-DASH, MSS, CMAF
- Automatic source input scanning
- Monitoring of all variants in OTT ladder
- **Encryption:** Verimatrix, Huawei KMS, MPEG TS DVB-BISS, Simulcrypt, Irdeto, AES-128

Probing

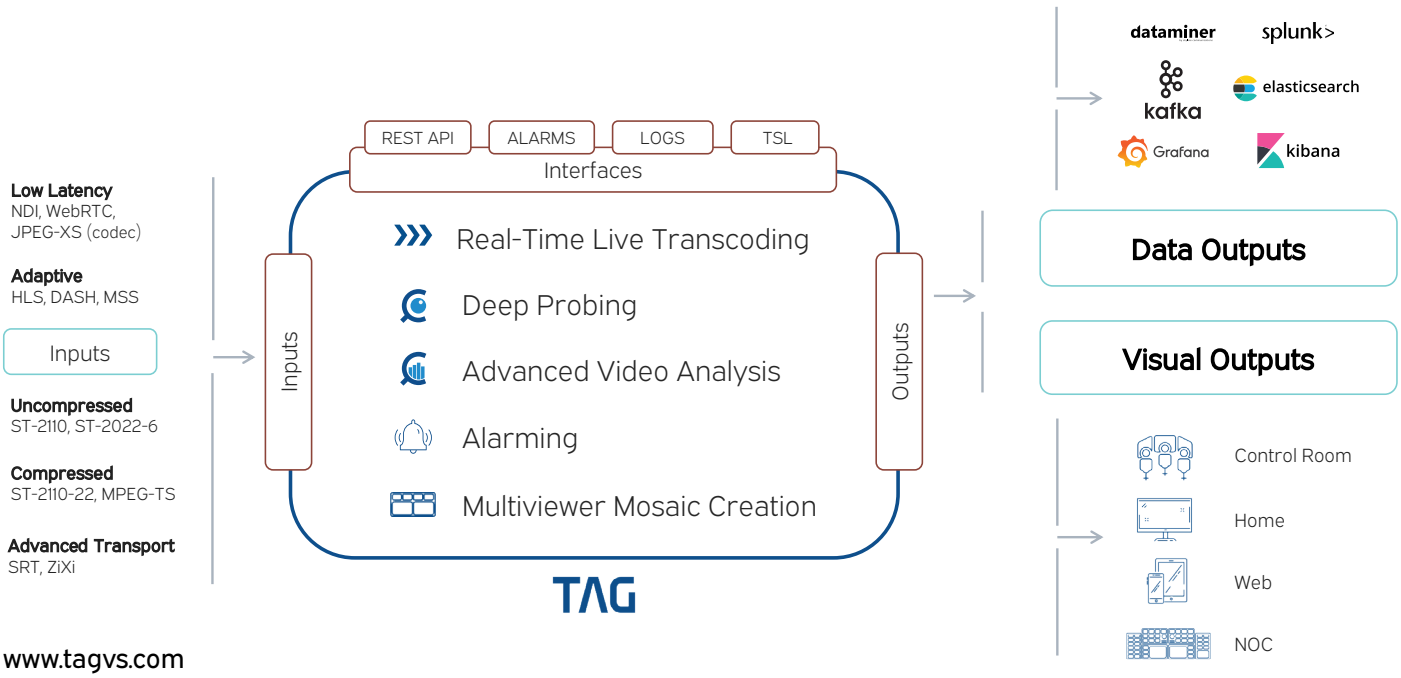
- Over 500 probing parameters
- **ETSI** TR 101 290 priority 1, 2, 3
- **Video** freeze/black/macroblock detection
- **Audio** loudness per EBU R-128, ITU-1770, ATSC A/8
- **Configurable** Thresholds/Notification sets
- Source template profile-matching
- **Monitoring Flexibility:**
  - Adaptive monitoring (automated, 3 levels)
  - Monitoring by Exception
- **Notifications:** SNMP, email, API, log file
- **Logging:** external NAS/syslog
- Forensic source record to file on error with continuous pre-record for TS and OTT sources
- SCTE 104 | 35 message monitoring, logging

Multiviewer

- Multiviewer with ultra-low latency realtime monitoring and headless operation
- Up to 100 inputs (tiles) per mosaic output
- Up to 16 independent mosaic outputs/server per MCM instance
- Up to 32 independently assignable audio pairs per mosaic TS output
- Full-customizable sized tiles per mosaic
- Side-by-side splitscreen visualization
- Mosaic BG from video or image
- Audio tracks per tile: 16 | UMDs per tile: 8
- Custom tile layout configurations
- Output resolutions: SD, HD, UHD
- Output: simultaneous uncompressed, compressed (TS) and HLS with audio (up to five clients/output)
- Unicast and multicast output
- On-screen clocks and count up/down timers
- Tallies and UMD (TSL protocol, TAG API)
- Streamed JPEG thumbnails for each input
- Carousel and Penalty Box modes

Platform

- **Topology:** dedicated COTS hardware, VM and cloud (AWS, Azure)
- **Server:** dual Xeon CPU. Dell R640/R650 recommended
- **GPU:** not required
- **Storage:** none required
- **Network:** Mellanox C5/C6 series for uncompressed SMPTE ST 2022-6; -7 / ST 2110
- **OS:** Linux Ubuntu, custom configuration
- **VM:** VmWare ESXi 6/6.5
- **AWS:** c4, c5, c5n, c5dn, m6i instance types
- **Full JSON API** integration of all capabilities
- TAG MCS system manager option
- **Network capacity:** up to 4x 100GB ports / server
- **Input capacity**: up to 96 HD uncompressed sources per server
- **Scaling:** server stacking, TAG bridge and MCS to enable large-scale systems
- PTP and NTP time synchronization
- Web-based configuration



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