

# Success Story

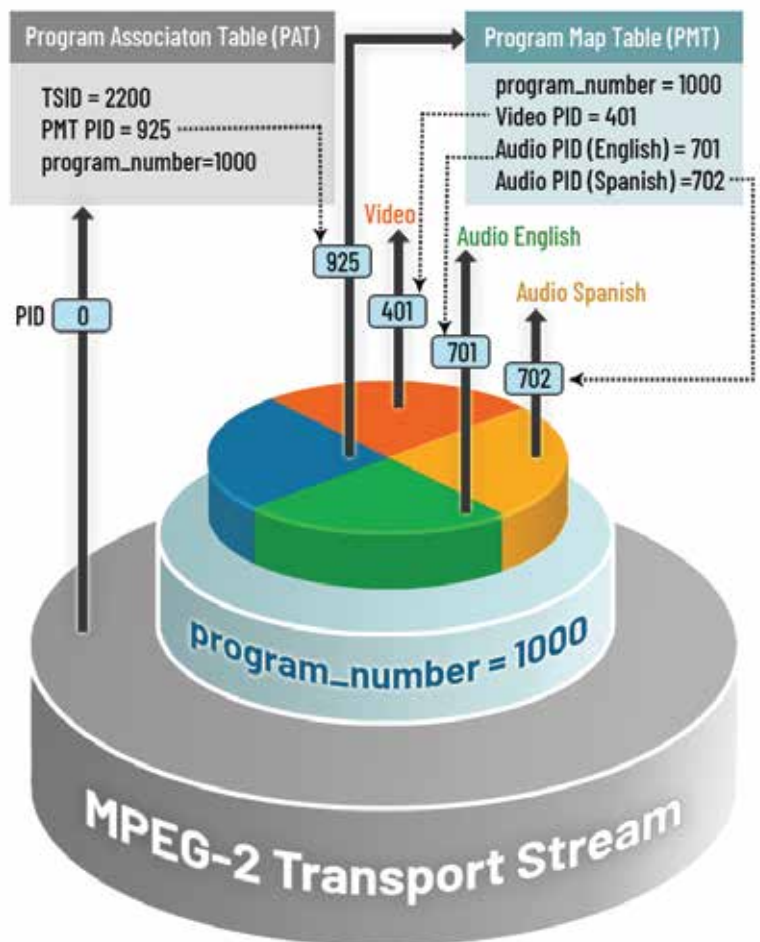
## Interra Systems' MPEG-2 Transport Stream Analyzer for Content Validation and Quality Assurance

*Advanced validation features and seamless integration into automated workflows enables media companies to deliver error-free MPEG-2 TS more efficiently*

### Introduction

MPEG-2 transport stream (MPEG-2 TS) is a widely used container format for transmission and storage of compressed video. MPEG-2 TS specifies how to multiplex the audio, video, and other auxiliary data for a given TV program or an on-demand video file. An MPEG-2 TS can contain multiple videos, and the standard allows packetized elementary streams to form a complete transport stream. For a video service operator, this increases bandwidth efficiency since multiple TV programs can be sent via a single channel. MPEG-2 TS continues to be the de-facto video delivery standard for ATSC, DVB, and IPTV video systems and is also used by some OTT service providers.

Transport streams contain the actual video and audio packets as well as key information regarding each video service and program, enabling decoders to properly decode and present the data to viewers. The elementary streams of audio and video are encapsulated to form a packetized elementary stream. After packetization, they are multiplexed into a serial stream known as a transport stream. At one time, a 188-byte packet is transmitted. On the receive side, the stream is decoded, and individual audio and video data is extracted and displayed on the user device.



### MPEG2 TS Structure

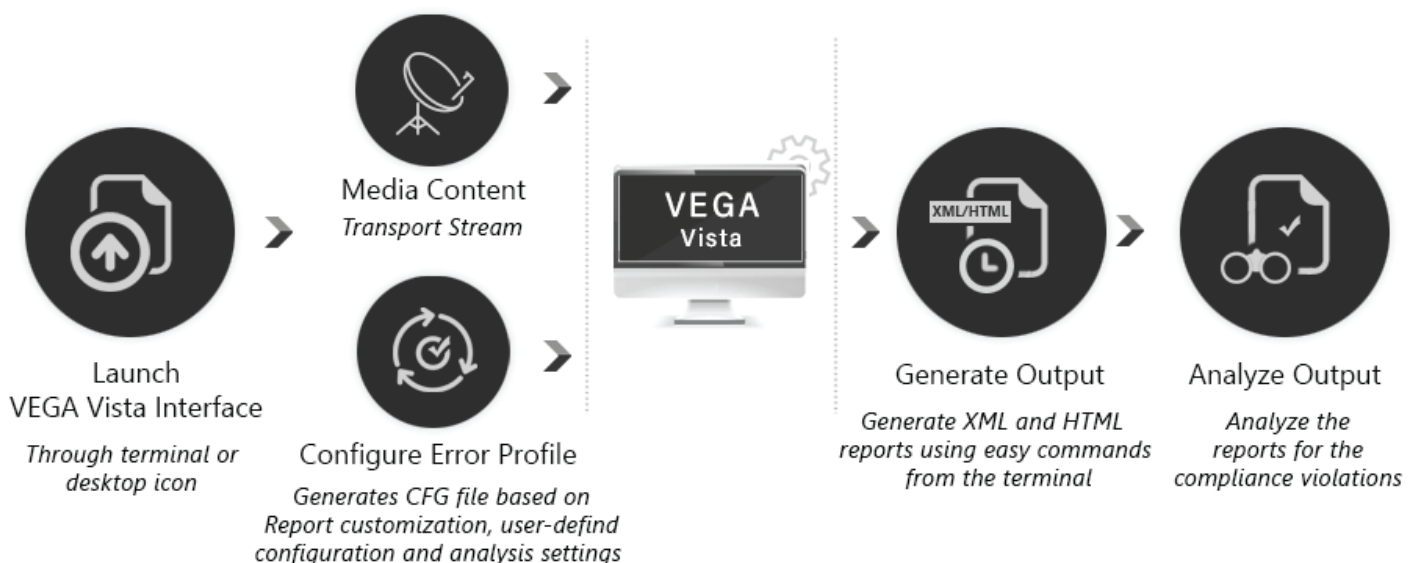
## The Solution

A TV network receives and creates new repositories of MPEG-2 TS files on a continuous basis. Many of the files received from content providers undergo a decoding and re-encoding process. Therefore, these files need to be checked for compliance and quality against a defined profile. Different profiles are created that contain fine-tuned requirements for various types of data such as closed captions, SCTE-35 messages, audio loudness, buffer analysis, and more. The MPEG-2 TS files may contain different types of elementary audio and video, such as HEVC, H.264, and Dolby DDPlus. A profile to check the elementary stream header is created for encoder compliance. Depending on the values defined in the profile and the actual values reported by the analyzer, the file is classified as either a "pass" or a "fail." Files that don't meet the specifications are forwarded to the appropriate group for further action. Parameters that are checked include:

- Video resolution
- Audio/Video bit rate for each service in the transport stream
- TR 101 290 errors
- PCR accuracy and drift rate
- PSI-SI information for each service
- Closed caption existence and syntax check

- Graphical reports for T-STD analysis, showing buffer occupancy and checks for buffer underflow and overflow conditions
- Continuous analysis of error logs and other reports provided by the analyzer are studied to assess encoder and decoder performance and fix errors
- Different templates/profiles are created on an ongoing basis to show Service Level Agreements (SLA) compliance. The SLAs might include closed captions, delivery of the program at the agreed upon bit rate, and more

Depending on the reason for the fault, files are remuxed, while maintaining the integrity of the encapsulated audio and video elementary streams. A dockerized version of the software is deployed for the cloud-based workflow. For encoder and QA teams that create software builds based on the results of the tests, the analyzer application can be invoked on any available cloud machine, on demand. This enables geographically dispersed teams to work collaboratively to analyze, debug, troubleshoot, and ultimately prepare error-free transport streams that conform to the user-specified content delivery profiles and quality. Depending on the amount of MPEG-2 TS files to be tested per day, multiple files can be run on multiple instances of the analyzer, speeding up the validation process.



## Conclusion

VEGA Vista decodes the entire MPEG-2 TS and presents it in a logical structured fashion so that the user can drill down to the required information. Detailed reports for parameters that affect QoS and QoE, such as frame rate, bit rate, buffer overflow and underflow, can be evaluated in a completely script-driven, automated environment.

By providing a complete set of checks and analysis features, VEGA Vista helps media companies assure MPEG-2 compliance as part of post-encoding, transcoding, and post-production workflows. With VEGA Vista, video service providers can perform comprehensive analysis of MPEG-2 TS for better quality of service and quality of experience.

VEGA Vista is easy to incorporate into existing or new workflows, as it can be installed on any on-premises server or in the cloud environment for ultimate scalability and flexibility. Professionals involved with research and development, QA and video delivery, will find VEGA Vista as an indispensable analyzer that will expedite development, identification, and troubleshooting of MPEG content. VEGA Vista is part of the VEGA media analyzer family from Interra Systems, renowned for in-depth analysis and accuracy of all popular video compression formats.

To learn more about VEGA Vista, please visit <https://www.interrasystems.com/Vega-vista.php>