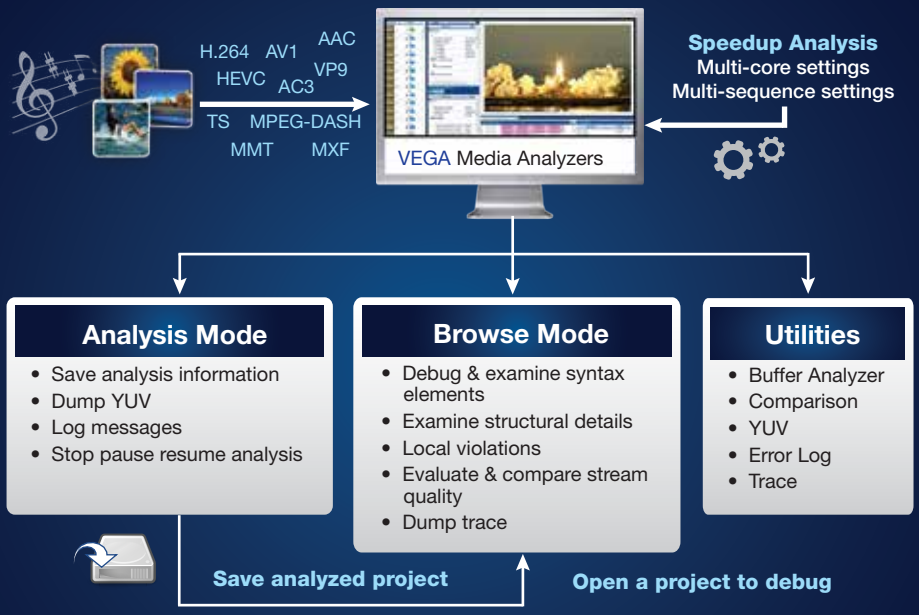
VEGA In-depth Media Analyzers

analyze ▪ debug ▪ refine ▪ optimize



VEGA Usage Model

VEGA is an industry leading media analysis platform for debugging, verification of standards compliance, and interoperability testing of encoded streams. VEGA enables navigation down to the deepest levels of a media file to generate error reports and analysis.This significantly reduces R&D and QA time in delivering standards-compliant video. VEGA supports all popular video compression and container standards and includes features such as video comparison and quality checks. These features help deliver high-quality media.

VEGA Advantages

- Accurate, in-depth video analysis assures standards compliance & interoperability
- Comprehensive format support: AV1, HEVC, H.264, MMT, HLS, MXF, VP9, VP8, VC1, MPEG-2, MPEG-DASH, JPEG-2K, ISM, PCAP
- Cost-effective, PC-based software with multi-core support
- Fast performance improves operational, R&D & QA efficiency
- Value-added tools enable video comparisons, video quality checks, buffer analysis and debugging
- Regular updates and aggressive product roadmap anticipates next generation requirements, meeting customer needs
- Encoding comparison, encoding regression tests, STB compatibility
- Responsive support team available 24X7 worldwide

With Dolby certified AC-3, DD Plus, Dolby-E analysis

VEGA has been adopted worldwide as the de facto standard for media analysis. 350 plus licenses in production use.

interra systems

VEGA Media Analyzer

For Analyzing and Debugging Media Streams

VEGA Media Analyzer is the most in-depth and reliable file-based media analyzer that presents complex information as simple visuals. It is a debug platform for all types of media streams encoded using various standard compression formats. The analyzer is an ideal choice for media professionals from industries such as semiconductor, SoC providers, encoder manufacturers, smart devices, HD video communications, OTT and streaming media.

VEGA Media Analyzer is a powerful tool for analyzing various media streams, such as AV1, HEVC, H264, VP9, HDR, TS, MP4, MKV, ABR etc.

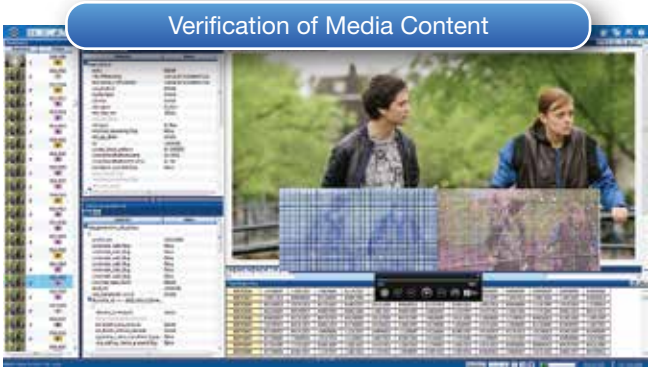
VEGA Media Analyzer Features

- Comprehensive, easy to navigate visuals, high level picture information down to feature thumbnail structure
- Frame by frame navigation down to the smallest block partitions of Frame
- Conformance violations at all levels to enable accurate examination of media standards
- Summary information for all levels - stream summary, sequence summary, Block (NAL / OBU.etc) summary, picture summary and more
- Analytical graphs for bird's-eye view of the stream: Bitrate, frame distribution, compression ratio, QP, DPB occupancy, prediction data and transform data
- Overlay of Slices, Tiles, Blocks over the picture
- Quick examination of coded bits, prediction data, motion vectors, QP, interpolation and reference index over the picture
- Detailed display of syntax elements at header and data levels
- DPB and reference picture information
- Quad Tree view for both HEVC and VP9 which displays the block splitting
- Display pixel values and pictures at every stage of decoding
- Graphical representation of in loop filter process
- Graphical representation of Intra prediction process
- Visualization of Closed Caption data
- Support for detailed residue view for HEVC and H264 streams
- Efficient and high-performance analysis - multi-core support
- Support for SCC (Screen Content Coding) Extension in HEVC video
- Support for Frext Streams (4:2:2, 4:4:4)
- Provides a microscopic view into MPEG-2 transport streams
- PCR inaccuracy and intervals, PCR drift rate, PCR frequency offset and PTS/DTS analysis
- Strong ABR content validation with respect to the manifest file and ability to report the minutest violations
  - Compliance to media standards
  - Verification of encoded streams' bit rates
- Detailed verification of chunks alignment based on the following:
  - Timing of encoded frame rate in elementary streams
  - Chunks play time
  - Stream structure
  - PTS/DTS encoded in TS
  - IDR alignment at start of chunks
- Verification of video and audio quality checks, such as blockiness, black frames, freeze frames, loudness, silence and CALM specification checks
- Play and switch between different Variants
- Analysis of QP variations across different bit rate streams
- Analysis of frame size and compression ratio variation

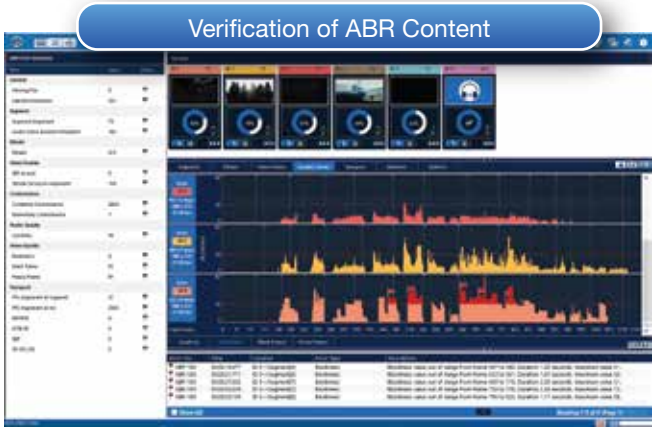
VEGA Media Analyzer Standards Support

- **Video Streams** - HEVC, H264, MPEG-1/ MPEG-2 Video, JPEG-2K, VP9, HDR, AV1
- **Audio Streams** - AAC, AC-3, EAC3, LPCM, MP3, ALS Audio, AES3 Audio
- **System Streams** - MMT, MXF, Transport / Program, MP4, MPEG-2, WebM, MKV, PCAP, TLV-MMT
- **ABR Streams**- MPEG-DASH, HTTP Live Streaming (HLS), Microsoft Smooth Streaming (ISM)
- **Line 21 formats** - EIA 608, EIA 708, AFD, XDS, SCTE-608, DIVICOM-608
- **Other Formats** - HDR-BT2020, HDR10, DVB Subtitle, ATSC 3.0 and TR101290 checks, TELETEXT

Verification of Media Content



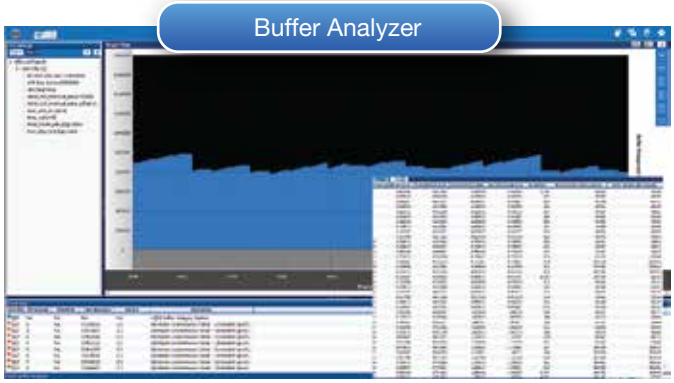
Verification of ABR Content



VEGA Analyzer Utilities

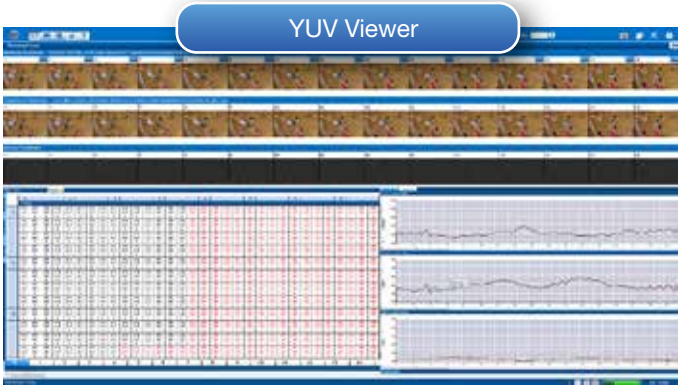
- **Buffer Analyzer**
  - Analyzes Coded Picture Buffer (CPB) and T-STD Buffer Model
  - Conformance violation as per standard
  - Rich Buffer analysis report for easy debugging

Buffer Analyzer



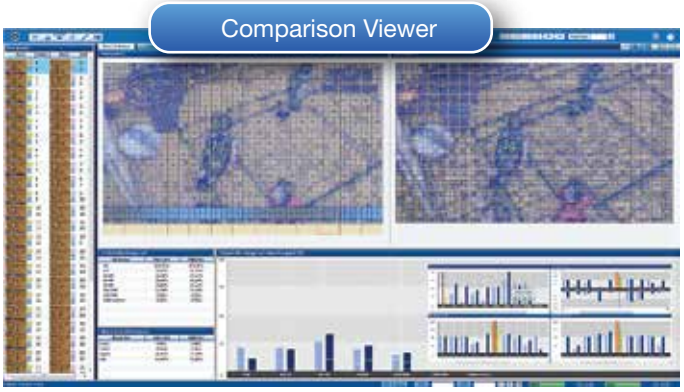
- **YUV Quality Viewer**
  - Evaluate video quality matrices such as PSNR, RMSE and SSIM
  - Evaluate pixel level comparisons
  - Play reference, comparison and residual video
  - Compare multiple YUVs

YUV Viewer



- **Comparison Viewer** (HEVC/H264/VP9 vs HEVC/H264/VP9)
  - Encoding comparison - bit rate, QP data, buffer occupancy, motion vectors and more
  - Quality comparison - contrast, blockiness, pixelation, and blurriness

Comparison Viewer



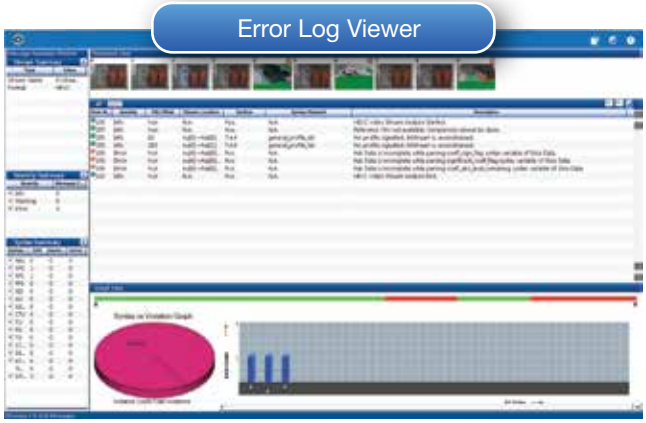
- **Commandline**
  - Analyze multiple files simultaneously in command prompt. Supported on Windows and Linux

- **Trace Viewer**
  - Examine various syntax elements in detail e.g. syntax element name, offset and value. The elements are linked with the Hex View

Trace Viewer

- **Error Log Viewer**
  - Examine, search, and filter error messages and dump the errors in XML or PDF file

Error Log Viewer



- **Batch Mode**
  - Used to analyze multiple files simultaneously in GUI

Batch Mode

- **File Info**
  - Quickly identify the high-level information about the stream

File Info

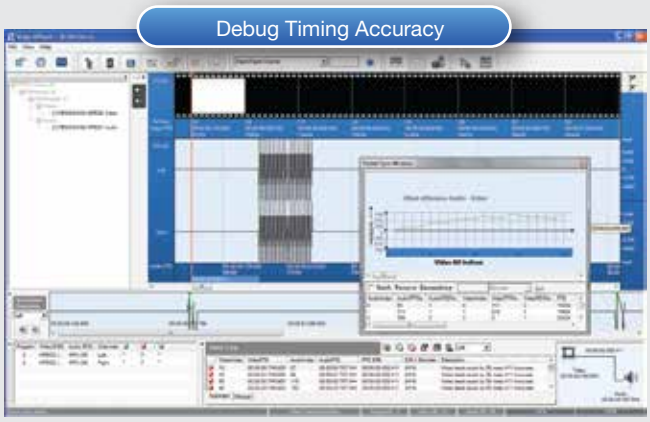
VEGA AVSync

Audio Video Sync Analysis and Debug

VEGA AVSync presents a detailed analysis on audio-video synchronization. It identifies out of sync points in the media content and provides relevant debug information to enable accurate assignment of Presentation Time Stamps. VEGA AVSync is designed to expedite testing and delivery of standards-compliant encoder, multiplexer and decoder systems.

VEGA AVSync Features

- Detailed insight into sync points: Packet number, frame number, PTS value
- Manual/Automatic detection of sync points
- Channel-related summary information: Audio/video index, sync points, out-of-sync points, PTS, and PTS Diffs
- Quick forward and backward navigation across the PTS timeline
- Support for rich set of AVSync test patterns used for line-up
- Coarse Sync measurements using Packet Sync feature
- Customization options for tolerance levels
- Integrated media player
- Messages in XML format for ease of distribution
- Facility to store analyzed data for future reference



VEGA AVSync Standards

System File - MPEG-2 transport, MPEG-2 Program, MP4, and fMP4

Video - HEVC, H.264, MPEG-4, and MPEG-2

Audio - AAC, AC-3, E-AC3 (Dolby Digital Plus), Dolby-E, AES-3/LPCM, MPEG-1/MPEG-2 Audio, and MP3

Continued Leadership in Standards Compliance, Debugging, and Interoperability

Interra Systems, Inc.
1601 S. De Anza Boulevard, Suite 212, Cupertino, CA 95014
Phone: +1 408 579 2000
Email: VEGA_info@interrasystems.com • www.interrasystems.com