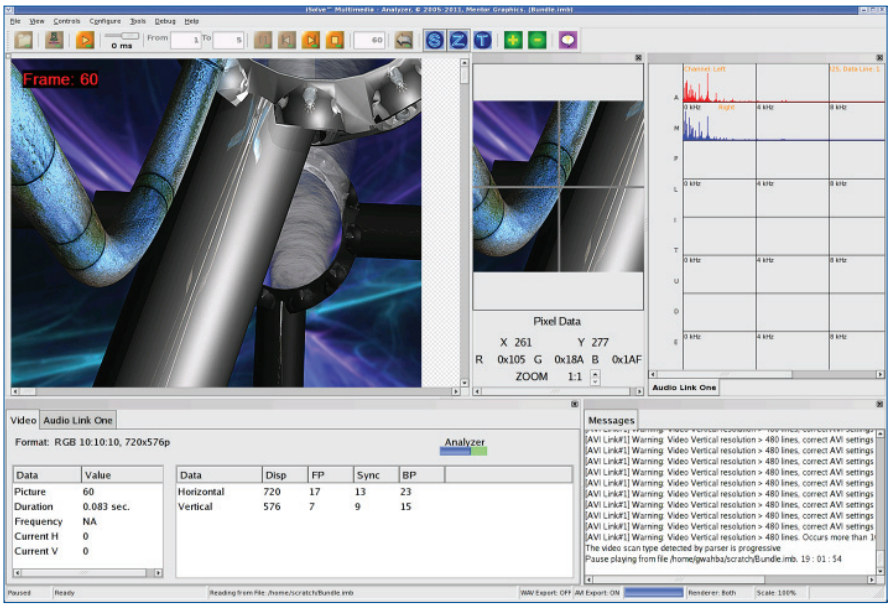
Virtual Multimedia Device



The Virtual Multimedia Device solution provides extensive analysis tools for the debug of video and audio content during a live emulation run.

Software-Based, System-Level Solutions for Hardware Emulation

As part of the Veloce® VirtuaLAB portfolio, the Virtual Multimedia Device solution enables early verification of multimedia processing capabilities, addressing one of the main challenges in developing SoC-based products, such as consumer electronic devices and portables that incorporate complex video and audio interfaces.

The Virtual Multimedia Device solution provides both analyzer and exerciser applications for SoC verification and test using Veloce's family of hardware emulators. This combination allows verification teams to identify and fix system errors in both hardware and software before silicon is produced, cutting costs and boosting productivity.

The exerciser application generates and streams video and audio to the RTL design running in a Veloce emulator. By using actual data streams, the multimedia exerciser application serves as a virtual hardware testbench for the video/audio interfaces on the SoC. The analyzer application collects, analyzes, and displays video/audio streams from the design RTL running in Veloce. The application can handle live or captured data from the design under test, running at MHz speeds in Veloce.

System-level verification using a Virtual Multimedia Device connected to Veloce via high-speed co-modeling channels is 1000s of times faster than software simulation, saving weeks or months of regression test time. Running billions of real-world cycles of data through an SoC prior to tapeout gives verification teams confidence in a design's integrity and allows them to meet customer delivery schedules and rigorous project goals.

FEATURES AND BENEFITS:

- Video formats: RGB, CCIR 601 and 656, SMIA 1.0 Raw Bayer, HDMI 1.4b YUV and RGB, DVI 1.0 RGB, and DisplayPort 1.1a
- Audio formats: I2S, S/PDIF, 32-bit linear PCM, and HDMI audio packets
- File formats: BMP, WAV, and AVI
- Trace tool: All received video and audio data processed for analysis
- Zoom window: Ability to zoom in to 15:1
- Statistics window: Pixel values, frame size, sync and porch widths, etc.
- HDMI interface version 1.4b: including HDMI 3D extensions and HDCP standard
- Supports DVI 1.0 and DisplayPort 1.1a HDTV formats
- API to support pixel data extraction from saved multimedia databases
- Fast, easy set up: A simple connection to any Veloce emulator
- Supports major industry standards: Improves potential for design reuse and helps ensure product interoperability for audio and video
- Investigate SoC video output: Visualization of design output to analyze video artifacts
- Investigate SoC audio output: Listen to audio output from the design
- Regression testing: Recorded video and audio data can be compared to reference data
- TCL-batch mode command interface allows generation of multimedia content
- Supports Veloce emulation and Questa® simulation

Variety of Video Formats

The Virtual Multimedia Device supports video formats RGB, YUV 4:2:2, and 4:4:4 and Raw Bayer 8/10-bits for mobile applications (SMIA 1.0). Both progressive and interlaced formats are supported with frame sizes up to and including 5600 x 4300 pixels for HDTV. Video output data is rendered and analyzed at the pixel level within any area of an image.

RGB

- Pixel resolutions: 24- and 30-bit
- Hsync, Vsync, front and back porch

YUV 4:2:2

- Pixel resolutions: 8-/10-bit or 16-/20-bit multiplexed
- Embedded sync (SAV/EAV, horizontal/vertical blanking)

YUV 4:4:4

- Pixel resolutions: 24- and 30-bit
- Embedded sync (SAV/EAV, horizontal/vertical blanking)

Raw Bayer

- Pixel resolutions: 8-bit and 10-bit
- Supports mobile applications as defined in SMIA 1.0

(All formats can be any frame size, up to 5600 x 4300, interlaced or progressive)

Variety of Audio Formats

The Virtual Multimedia Device supports audio outputs: I2S (Inter-IC sound), S/PDIF (IEC 958), and 32-bit linear PCM. The captured audio data is stored on the PC for replay at any time, including instantaneous "snapshot" replay from the GUI.

HDMI Interface

The Virtual Multimedia Device supports the popular HDMI interface standard, version 1.4b, for the capture and analysis of audio, video, and data packet content from the design under test. It includes HDMI 3D extensions for the analysis of 3D video data and large frame sizes (4k).

It also supports the HDCP 1.4 content protection standard for the verification of an HDCP source and sink in the Veloce emulator, by mimicking an HDCP source/sink device.

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

Additional HDTV Interfaces

The Virtual Multimedia Device supports popular HDTV interfaces, such as the DVI 1.0 and DisplayPort 1.1a standards.

Trace Tools

In addition to the GUI analyzer capabilities, the Virtual Multimedia Device has a trace tool that allows the user to extract video and audio data, including synchronization signals, for postprocessing and analysis.

File Formats

The Virtual Multimedia Device supports recording and replay of both WAV (audio) and AVI (audio/video) files in addition to its own native recorded file format.

Debug Multimedia Data

The Virtual Multimedia Device supports API interface functions to allow the user to extract data of interest from a previously created multimedia database, and manipulate it for additional detailed analysis.

Plug-and-Play Ready

Once connected to Mentor Graphics verification accelerators, the Virtual Multimedia Device offers a rapid route towards system verification of a design in RTL verification.

Deliverables

- Software applications for exerciser and analyzer
- Test examples suite for multiple protocols
- User Guide

The Virtual Multimedia Device collects, analyzes, and visualizes video and audio streams from designs running in Mentor Graphics accelerators.

For the latest product information, call us or visit: www.mentor.com/emulation

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