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Video Quality Analysis for Low-Impairment Compression Standards

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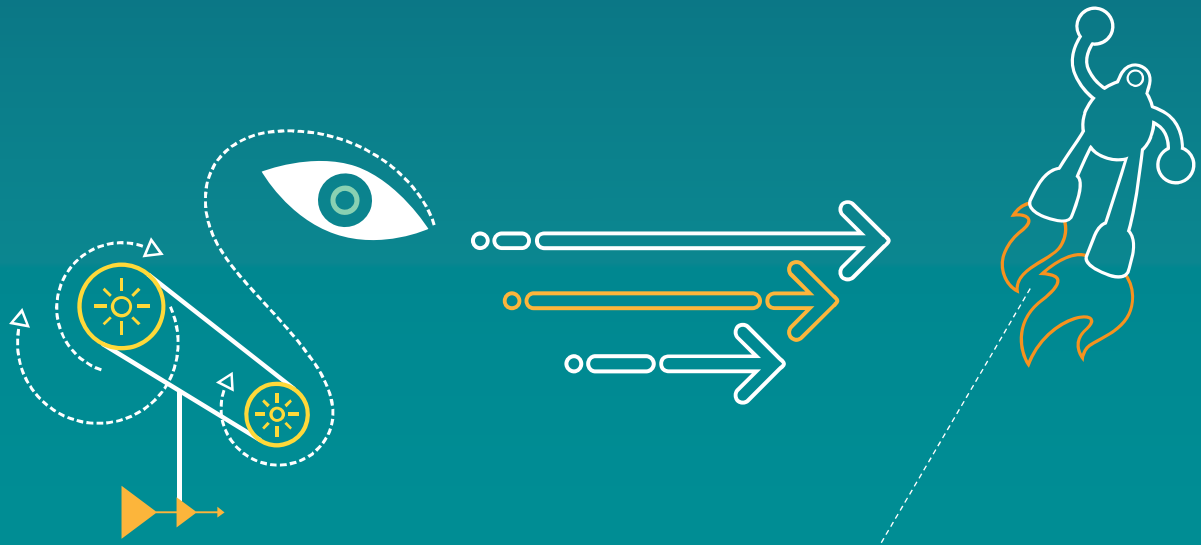
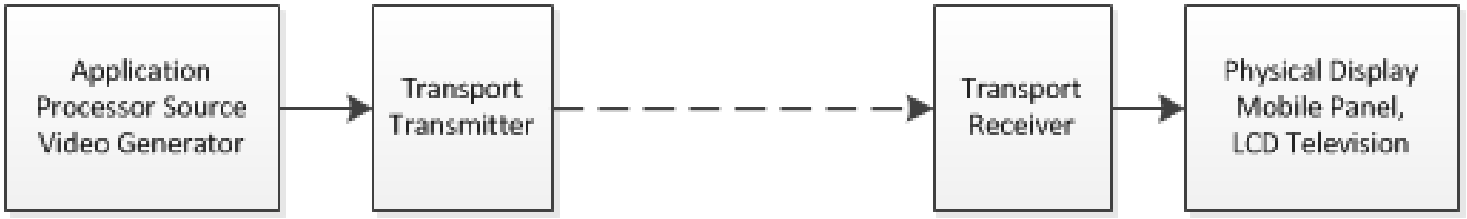


Real-time Display Stream Compression

Visually Lossless Low-Compression Rate Applications

- Compression on physical display links



App Processor Source Video Generator	Pixel Format	Required Pixel Rate (Mpixel/sec)	Transport Bandwidth in Gbits/Sec	Possible Compression Rate	Transport Compressed Link Rate (Gbit/sec)
Progressive HD 1920x1080	24-bit/pixel RGB	124	2.986	3:1 (24bpp->8bpc)	995
WUXGA 2560x1600	24-bit/pixel RGB	246	5.898	3:1 (24bpp->8bpc)	1.966
Ultra-HD 3840x2160	24-bit/pixel RGB	498	11.944	4:1 (24bpp->6bpc)	2.986
5K Displays (5120x3200)	24-bit/pixel RGB	983	23.593	4:1 (24bpp->6bpc)	5.898
8K Broadcast (7680x4320)	24-bit/pixel RGB	1,991	47.776	4:1 (24bpp->6bpc)	11.944

Compression Application Requirements

- Initially targeted at mobile display applications ranging from 60 PPD. Display sizes range from 5” to 15” displays.
- Application requires constant bit-rate (CBR) lossy compression
- Picture and video quality must be visually lossless.
- Define quality for objective and subjective trials constrained by the required pixels-per-degree.
- Visually lossless picture quality. The end-user should not see obvious visual artifacts for a wide variety of content.
  - User Interface Graphics
  - Video Game Content
  - Internet web browsing
  - Mobile camera recording and playback (still and video)
  - Standard Internet and Broadcast playback

Compression Application Requirements (cont..)

Visually Lossless – Low-Impairment Compression

- Wide variety of pixel formats:
  - RGB and YPrPb 4:4:4
  - 8/10/12-bit formats

DSC Algorithm Overview

Public Whitepaper Available on VESA.org Website

http://www.vesa.org/wp-content/uploads/2014/04/VESA_DSC-ETP200.pdf

Possible VQEG sub-committee proposals

Visually Lossless Low-Compression Rate Applications

- Development of Subjective Measurement Protocol
  - Static and Motion Testing
- Development of Objective Measurement Protocol
  - VIF, VQM, SSIM
  - PSNR and Local MSE Error analysis and inadequate

Use for Qualcomm Technologies, Inc.

Thank you

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