Video Quality Analysis for Low-Impairment Compression Standards
Real-time Display Stream Compression

**Visually Lossless** Low-Compression Rate Applications

- Compression on physical display links

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

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