EDID: Problems, Pitfalls and Complications

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EDID: Extended Display Identification Data

- Display capability information that is typically stored in an EEPROM in the display and that is read via I²C by the source.

- The core standard is maintained by VESA. EDID 1.0 appeared in August 1994. Originally for VGA displays, later extended to DVI, HDMI and DisplayPort.

- How EDIDs are read is defined in the VESA E-DDC standard (Enhanced Display Data Channel). Note that to store EDIDs specialized EEPROMs are needed that support the E-DDC standard.

- The current versions are EDID 1.3 (required by HDMI interfaces, but why?) and EDID 1.4 (used by DisplayPort interfaces).

- An EDID typically consists of 1 to 4 blocks of 128 bytes each. The first block (the EDID Base Block) is defined by the VESA EDID standard, and there may be up to 255 additional blocks (called Extension Blocks). Standards can define their own Extension Block variants.

- In practice the only Extension Blocks that you will see are CTA-861 (defined by the CTA organization) and DisplayID (defined by VESA).
HDMI: Signaling Between Laptop and Display
Complication: Hotplug Detect

- The Sink supplies a Hotplug Detect pin (HPD). If the HPD is high, then the Source can assume there is a valid EDID and that it can read. The HDMI specification requires these voltages for the HPD at the Source side: 0-0.8V = Low, 2-5.3V = High. Note how the range from 0.8-2V is left unspecified.

- The HPD voltage can drop by a lot when using long (> 5 meters) HDMI cables, even below 2V, so the voltage threshold for Sources has to be lower than that if you want to accommodate such cables.

- If the HPD goes low for 100 ms or more, then the Source has to re-read the EDID when it goes high again since that indicates that the EDID might have changed. Often this does not happen.

- Displays often toggle HPD when switching inputs or transitioning from On to Standby or vice versa. Pin bounce when (un)plugging can also cause problems.
Base EDID for a 5120x1440 Monitor

Block 0, Base EDID:
EDID Structure Version & Revision: 1.3
Vendor & Product Identification:
  Manufacturer: XXX
  Model: 1234
  Serial Number: 123456789
  Made in: week 1 of 2020
Basic Display Parameters & Features:
  Digital display
  Maximum image size: 119 cm x 34 cm
  Gamma: 2.20
  DPMS levels: Off
  RGB color display
  First detailed timing is the preferred timing
Color Characteristics:
  Red : 0.6777, 0.3105
  Green: 0.2734, 0.6542
  Blue : 0.1425, 0.0566
  White: 0.3125, 0.3291

Complication: Image size is often wrong, esp. between displays of the same series, but with different sizes. Also limited to 255 cm.

Pitfall: The Gamma + Color Characteristics are not those of the sRGB colorspace as used by PCs.

Transmitting RGB over HDMI is supposed to use this information (stated in a footnote of a large table in CTA-861), so the PC has to convert from sRGB to this colorspace.

In practice only Apple does this, everyone else ignores it and transmits sRGB. Calibrating a display from a MacBook and from a Windows/linux laptop will produce different results! It is also completely unclear what displays do with this.

CTA-861.6 adds explicit sRGB or defaultRGB signaling support, hopefully eliminating this issue in the future.
## Base EDID for a 5120x1440 Monitor

### Established Timings I & II:

<table>
<thead>
<tr>
<th>Device</th>
<th>Resolution</th>
<th>Refresh Rate</th>
<th>Aspect</th>
<th>Horizontal Frequency</th>
<th>Vertical Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>720x400</td>
<td>70.081663 Hz</td>
<td>9:5</td>
<td>31.467 kHz</td>
<td>28.320000 MHz</td>
</tr>
<tr>
<td>DMT 0x04: 640x480</td>
<td>59.940476 Hz</td>
<td>4:3</td>
<td>31.469 kHz</td>
<td>25.175000 MHz</td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>640x480</td>
<td>66.666667 Hz</td>
<td>4:3</td>
<td>35.000 kHz</td>
<td>30.240000 MHz</td>
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<tr>
<td>DMT 0x05: 640x480</td>
<td>72.808802 Hz</td>
<td>4:3</td>
<td>37.861 kHz</td>
<td>31.500000 MHz</td>
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</tr>
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<td>DMT 0x06: 640x480</td>
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<td>37.500 kHz</td>
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<tr>
<td>DMT 0x08: 800x600</td>
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<td>35.156 kHz</td>
<td>36.000000 MHz</td>
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</tr>
<tr>
<td>DMT 0x09: 800x600</td>
<td>60.316541 Hz</td>
<td>4:3</td>
<td>37.879 kHz</td>
<td>40.000000 MHz</td>
<td></td>
</tr>
<tr>
<td>DMT 0x0a: 800x600</td>
<td>72.187572 Hz</td>
<td>4:3</td>
<td>48.077 kHz</td>
<td>50.000000 MHz</td>
<td></td>
</tr>
<tr>
<td>DMT 0x0b: 800x600</td>
<td>75.000000 Hz</td>
<td>4:3</td>
<td>46.875 kHz</td>
<td>49.500000 MHz</td>
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<tr>
<td>Apple</td>
<td>832x624</td>
<td>74.551266 Hz</td>
<td>4:3</td>
<td>49.726 kHz</td>
<td>57.284000 MHz</td>
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<tr>
<td>DMT 0x10: 1024x768</td>
<td>60.003840 Hz</td>
<td>4:3</td>
<td>48.363 kHz</td>
<td>65.000000 MHz</td>
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</tr>
<tr>
<td>DMT 0x11: 1024x768</td>
<td>70.069359 Hz</td>
<td>4:3</td>
<td>56.476 kHz</td>
<td>75.000000 MHz</td>
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<tr>
<td>DMT 0x12: 1024x768</td>
<td>75.028582 Hz</td>
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<td>60.023 kHz</td>
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<tr>
<td>DMT 0x24: 1280x1024</td>
<td>75.024675 Hz</td>
<td>5:4</td>
<td>79.976 kHz</td>
<td>135.000000 MHz</td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>1152x870</td>
<td>75.061550 Hz</td>
<td>192:145</td>
<td>68.681 kHz</td>
<td>100.000000 MHz</td>
</tr>
</tbody>
</table>
Standard Timings:

- **DMT 0x15:** 1152x864 75.000000 Hz 4:3 67.500 kHz 108.000000 MHz
- **DMT 0x1c:** 1280x800 59.810326 Hz 16:10 49.702 kHz 83.500000 MHz
- **DMT 0x55:** 1280x720 60.000000 Hz 16:9 45.000 kHz 74.250000 MHz
- **DMT 0x23:** 1280x1024 60.019740 Hz 5:4 63.981 kHz 108.000000 MHz
- **DMT 0x53:** 1600x900 60.000000 Hz 16:9 60.000 kHz 108.000000 MHz (RB)
- **DMT 0x3a:** 1680x1050 59.954250 Hz 16:10 65.290 kHz 146.250000 MHz
- **DMT 0x2f:** 1440x900 59.887445 Hz 16:10 55.935 kHz 106.500000 MHz
- **DMT 0x52:** 1920x1080 60.000000 Hz 16:9 67.500 kHz 148.500000 MHz

Detailed Timing Descriptors:

- **DTD 1:** 3840x1080 59.968497 Hz 32:9 66.625 kHz 266.500000 MHz (1193 mm x 336 mm)
  
  - Hfront: 48
  - Hsync: 32
  - Hback: 80
  - Hpolf: P
  - Vfront: 3
  - Vsync: 10
  - Vback: 18
  - Vpolf: N

Display Range Limits:

- Monitor ranges (GTF): 24-120 Hz V, 30-160 kHz H, max dotclock 600 MHz
- Display Product Name: 'ABCDEF'
- Display Product Serial Number: '123456789'
- Extension blocks: 3
- Checksum: 0x89
Extension Block 1 for a 5120x1440 Monitor

Block 1, Block Map Extension Block:
- Block 2: CTA-861 Extension Block
- Block 3: DisplayID Extension Block
Checksum: 0x9e

• Originally EDIDs were one block (128 bytes) long. Later versions allowed up to 2 blocks. Starting with EDID 1.3 up to 256 blocks could be addressed (Enhanced EDID, or E-EDID). In practice the vast majority of EDIDs is just 2 blocks, but increasingly 3 and 4 block EDIDs are seen.

• Problem: EDID 1.3 requires that for EDIDs of more than 2 blocks the second block is a Block Map Extension Block (defined by VESA), which is basically an index of the following blocks. This just wastes EEPROM space and EDID 1.4 did away with that. But HDMI is stuck on 1.3, so still needs this.

• Complication: older transmitter hardware might support only 2 blocks. Newer hardware will usually support at least 4 blocks.

• Pitfall: to work around this HDMI 2.1 (Amendment A1), added an HDMI Forum EDID Extension Override Data Block for use with the CTA-861 Extension Block to override the number of Extension Blocks as reported in the first EDID block. So if the base block reports 1 Extension Block, and that CTA-861 Extension Block contains this HDMI Data Block, then the real number of Extension Blocks is equal to what is reported here. Thus bypassing the need for the Block Map.
Extension Block 2 for a 5120x1440 Monitor

Block 2, CTA-861 Extension Block:
Revision: 3
Underscans IT Video Formats by default
Basic audio support
Supports YCbCr 4:4:4
Supports YCbCr 4:2:2
Native detailed modes: 1

Video Data Block:

<table>
<thead>
<tr>
<th>VIC</th>
<th>Resolution</th>
<th>Refresh Rate</th>
<th>Aspect Ratio</th>
<th>Horizontal Frequency</th>
<th>Vertical Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1920x1080</td>
<td>60.000000 Hz</td>
<td>16:9</td>
<td>67.500 kHz</td>
<td>148.500000 MHz</td>
</tr>
<tr>
<td>97</td>
<td>3840x2160</td>
<td>60.000000 Hz</td>
<td>16:9</td>
<td>135.000 kHz</td>
<td>594.000000 MHz</td>
</tr>
<tr>
<td>96</td>
<td>3840x2160</td>
<td>50.000000 Hz</td>
<td>16:9</td>
<td>112.500 kHz</td>
<td>594.000000 MHz</td>
</tr>
<tr>
<td>31</td>
<td>1920x1080</td>
<td>50.000000 Hz</td>
<td>16:9</td>
<td>56.250 kHz</td>
<td>148.500000 MHz</td>
</tr>
<tr>
<td>4</td>
<td>1280x720</td>
<td>50.000000 Hz</td>
<td>16:9</td>
<td>45.000 kHz</td>
<td>74.250000 MHz</td>
</tr>
<tr>
<td>19</td>
<td>1280x720</td>
<td>50.000000 Hz</td>
<td>16:9</td>
<td>37.500 kHz</td>
<td>74.250000 MHz</td>
</tr>
<tr>
<td>18</td>
<td>720x576</td>
<td>50.000000 Hz</td>
<td>16:9</td>
<td>31.250 kHz</td>
<td>27.000000 MHz</td>
</tr>
<tr>
<td>3</td>
<td>720x480</td>
<td>59.940060 Hz</td>
<td>16:9</td>
<td>31.469 kHz</td>
<td>27.000000 MHz</td>
</tr>
<tr>
<td>90</td>
<td>2560x1080</td>
<td>60.000000 Hz</td>
<td>64:27</td>
<td>66.000 kHz</td>
<td>198.000000 MHz</td>
</tr>
<tr>
<td>93</td>
<td>3840x2160</td>
<td>24.000000 Hz</td>
<td>16:9</td>
<td>54.000 kHz</td>
<td>297.000000 MHz</td>
</tr>
<tr>
<td>94</td>
<td>3840x2160</td>
<td>25.000000 Hz</td>
<td>16:9</td>
<td>56.250 kHz</td>
<td>297.000000 MHz</td>
</tr>
<tr>
<td>95</td>
<td>3840x2160</td>
<td>30.000000 Hz</td>
<td>16:9</td>
<td>67.500 kHz</td>
<td>297.000000 MHz</td>
</tr>
</tbody>
</table>
Extension Block 2 for a 5120x1440 Monitor

Audio Data Block:
- Linear PCM:
  - Max channels: 2
  - Supported sample rates (kHz): 48 44.1 32
  - Supported sample sizes (bits): 24 20 16

Speaker Allocation Data Block:
- FL/FR - Front Left/Right

Colorimetry Data Block:
- BT2020YCC
- BT2020RGB

Video Capability Data Block:
- YCbCr quantization: No Data
- RGB quantization: Selectable (via AVI Q)
- PT scan behavior: No Data
- IT scan behavior: Supports both over- and underscan
- CE scan behavior: Supports both over- and underscan
Problem: RGB Quantization Range

- Full Range: red, green and blue are encoded with values 0-255: 0=off, 255=full brightness.
- Limited Range: values are 16-235: 16=off, 235=full brightness.
- Consumer Electronics equipment traditionally defaults to Limited Range for RGB, and IT equipment to Full Range. That was fine, until the two worlds collided...
- According to CTA-861 by default the CE video timings (720p, 1080p, 4k) should use Limited Range, and IT video timings (1920x1200, 4096x2160) should use Full Range.
- The chances of both Source and Sink doing the Right Thing are 50/50 at best. And that goes down even more when you add DP-to-HDMI (or vice versa) adapters into the mix. PC monitors behave differently from TVs, and different graphics drivers make different choices, and that can even depend on the OS.
- Since CTA-861-H Sinks are required to set Selectable RGB Quantization Range to 1, allowing Sources to explicitly signal what they are using.
- If you design a Sink, then please set this bit to 1. If you are a Source, please check for this and explicitly signal the RGB Quantization Range; or even better: always signal the RGB Quantization Range regardless.
Extension Block 2 for a 5120x1440 Monitor

Vendor-Specific Data Block (HDMI), OUI 00-0C-03:
  Source physical address: 1.0.0.0
  Supports_AI
  DC_36bit
  DC_30bit
  DC_Y444
  Maximum TMDS clock: 300 MHz

Extended HDMI video details:
  HDMI VICs:
    HDMI VIC 1:  3840x2160  30.000000 Hz  16:9  67.500 kHz  297.000000 MHz
    HDMI VIC 2:  3840x2160  25.000000 Hz  16:9  56.250 kHz  297.000000 MHz
    HDMI VIC 3:  3840x2160  24.000000 Hz  16:9  54.000 kHz  297.000000 MHz

Vendor-Specific Data Block (HDMI Forum), OUI C4-5D-D8:
  Version: 1
  Maximum TMDS Character Rate: 600 MHz
  SCDC Present
  Supports 12-bits/component Deep Color 4:2:0 Pixel Encoding
  Supports 10-bits/component Deep Color 4:2:0 Pixel Encoding
Problem: HDMI VICs

- When HDMI 1.4 introduced 4k support, there were no CTA-861 VIC codes for that, so they rolled their own: HDMI VICs.
- The HDMI Specification never specified the default RGB Quantization Range for these HDMI VICs, so implementers did not know what to do: limited or full range?
- Later CTA-861 added ‘proper’ VICs for these timings.
- And later still the HDMI Spec clarified that the HDMI VICs can be considered equivalent to the CTA-861 VICs and that both can be used. Thus the answer to the default RGB Quantization Range question is: Limited Range.
Pitfall: HDMI VSDBs

- The presence of HDMI Vendor-Specific Data Blocks in the CTA-861 Extension Block indicates an HDMI interface, as opposed to an e.g. DisplayPort interface.
- Except if there is a DP/USB-C to HDMI adapter in between: the adapter may or may not remove these Data Blocks. And an HDMI to DP/USB-C adapter may or may not add these Data Blocks to the EDID it exposes.
- What interface adapters are supposed to do with EDIDs is poorly defined, if at all.
Extension Block 2 for a 5120x1440 Monitor

YCbCr 4:2:0 Capability Map Data Block:
  VIC 97: 3840x2160  60.000000 Hz  16:9  135.000 kHz  594.000000 MHz
  VIC 96: 3840x2160  50.000000 Hz  16:9  112.500 kHz  594.000000 MHz

HDR Static Metadata Data Block:
  Electro optical transfer functions:
    Traditional gamma - SDR luminance range
      SMPTE ST2084
  Supported static metadata descriptors:
    Static metadata type 1

Detailed Timing Descriptors:
  DTD 2: 2560x1440  59.950550 Hz  16:9  88.787 kHz  241.500000 MHz (1193 mm x 336 mm)
    Hfront  48  Hsync  32  Hback  80  HpOL  P
    Vfront  3  Vsync  5  Vback  33  Vpol  N
  DTD 3: 2560x1080  60.000000 Hz  64:27  66.000 kHz  198.000000 MHz (1193 mm x 336 mm)
    Hfront 248  Hsync  44  Hback 148  HpOL  P
    Vfront  4  Vsync  5  Vback  11  Vpol  P

Checksum: 0x7f
Extension Block 3 for a 5120x1440 Monitor

Block 3, DisplayID Extension Block:
  Version: 1.2
  Extension Count: 0
  Display Product Type: Extension Section

Video Timing Modes Type 1 - Detailed Timings Data Block:
  DTD: 5120x1440 59.976879 Hz 0:0 88.826 kHz 469.000000 MHz (aspect undefined, no 3D stereo, preferred)
    Hfront 48 Hsync 32 Hback 80 Hpol P
    Vfront 3 Vsync 10 Vback 28 Vpol N

  DTD: 5120x1440 29.977651 Hz 0:0 43.797 kHz 231.250000 MHz (aspect undefined, no 3D stereo)
    Hfront 48 Hsync 32 Hback 80 Hpol P
    Vfront 3 Vsync 10 Vback 28 Vpol N

Checksum: 0x89
Checksum: 0x90
Problems: CTA-861 + DisplayID Blocks

- Traditionally HDMI interfaces use the EDID 1.3 Block + a CTA-861 Extension Block. And DisplayPort interfaces use the EDID 1.4 Block + VESA DisplayID Extension Block.

- Some EDIDs have both. One reason (common for 5120x1440 displays) is that CTA-861 couldn’t represent such resolutions until support for that was added in CTA-861-H (December 2020). And reporting such a resolution as a native resolution only became available in CTA-861.6 (February 2022). DisplayID could always do this, so both Extension Blocks are sometimes reported.

- Even for DisplayPort interfaces CTA-861 is often used in addition to DisplayID to 1) share most of the EDID with another HDMI port, and/or 2) since CTA-861 makes it easy to report commonly used resolutions (1080p, 4k, etc.).

- There are no rules which of the two Extension Blocks would have priority in case of conflicting information, there is no coordination between the two standards bodies in this respect.

- You end up with awful heuristics in your code, trying to support this mess.
EDID Parser/Checker: edid-decode

- Creating EDIDs is a painful process: the standards can be hard to read, there is a lot of information and it is hard to know that all corner cases were caught.

- The edid-decode utility (dating back to 2006!) helps with this: it parses an EDID into human readable text.

- Originally maintained by Adam Jackson, it had become outdated by 2017. Since 2018 I have been maintaining it and added support for the latest features and also worked on improving the conformity checks.

- I also provide access to this via a webpage: https://hverkuil.home.xs4all.nl/edid-decode/edid-decode.html
EDID Parser/Checker: edid-decode

- **Useful options:**
  - -c, --check Check if the EDID conforms to the standards, failures and warnings are reported at the end.
  - -n, --native-resolution Report the native resolution.
  - -p, --preferred-timings Report the preferred timings.

- **Timing options:**
  - --std <byte1>,<byte2> Show the standard timing represented by these two bytes.
  - --dmt <dmt> Show the timings for the DMT with the given DMT ID.
  - --vic <vic> Show the timings for this VIC.
  - --hdmi-vic <hdmivic> Show the timings for this HDMI VIC.
  - --cvt w=<width>,h=<height>,fps=<fps>[,[rb=<rb>]][,[interlaced]][,[overscan]][,[alt] [,hblank=<hblank>]][,[vblank=<vblank>]][,[early-vsync] Calculate the CVT timings for the given format.
  - --gtf w=<width>,h=<height>[,[fps=<fps>]][,[horfreq=<horfreq>]][,[pixclk=<pixclk>]][,[interlaced] [,overscan]][,[secondary]][,[C=<c>]][,[M=<m>]][,[K=<k>]][,[J=<j>]] Calculate the GTF timings for the given format.
  - --ovt (rid=<rid>|w=<width>,h=<height>),fps=<fps> Calculate the OVT timings for the given format.
  - --list-established-timings List all known Established Timings.
  - --list-dmts List all known DMTs.
  - --list-vics List all known VICs.
  - --list-hdmi-vics List all known HDMI VICs.
  - --list-rids List all known RIDs.
  - --list-rid-timings <rid> List all timings for RID <rid> or all known RIDs if <rid> is 0.
Preferred timings for a 5120x1440 Monitor

Preferred Video Timing if only Block 0 is parsed:

- DTD: 3840x1080 59.968497 Hz 32:9 66.625 kHz 266.500000 MHz (1193 mm x 336 mm)
- Hfront 48 Hsync 32 Hback 80 Hpol P
- Vfront 3 Vsync 10 Vback 18 Vpol N

Preferred Video Timings if Block 0 and CTA-861 Blocks are parsed:

- DTD: 3840x1080 59.968497 Hz 32:9 66.625 kHz 266.500000 MHz (1193 mm x 336 mm)
- Hfront 48 Hsync 32 Hback 80 Hpol P
- Vfront 3 Vsync 10 Vback 18 Vpol N
- VIC: 1920x1080 60.000000 Hz 16:9 67.500 kHz 148.500000 MHz (native)
- Hfront 88 Hsync 44 Hback 148 Hpol P
- Vfront 4 Vsync 5 Vback 36 Vpol P

Preferred Video Timing if Block 0 and DisplayID Blocks are parsed:

- DTD: 5120x1440 59.976879 Hz 0:0 88.826 kHz 469.000000 MHz (preferred)
- Hfront 48 Hsync 32 Hback 80 Hpol P
- Vfront 3 Vsync 10 Vback 28 Vpol N
Native resolutions for a 5120x1440 Monitor

Native Video Resolution if only Block 0 is parsed:
3840x1080

Native Video Resolutions if Block 0 and CTA-861 Blocks are parsed:
1920x1080
3840x1080
DisplayID Type VII Video Timing Data Block:
- VTDB 1: 5120x2160  60.000000 Hz  1:1  133.320 kHz  693.264000 MHz (aspect 1:1)

DisplayID Type VIII Video Timing Data Block:
- DMT 0x48: 1920x1200  119.908612 Hz  16:10  152.404 kHz  317.000000 MHz (RB)

DisplayID Type X Video Timing Data Block:
- VTDB 2: 5120x1440  50.001305 Hz  32:9  73.702 kHz  383.250000 MHz (RBv3, aspect 32:9)

Video Format Data Block:
- RID 7@30p: 3840x1080  30.000000 Hz  32:9  33.000 kHz  134.112000 MHz
- RID 7@60p: 3840x1080  60.000000 Hz  32:9  67.200 kHz  268.800000 MHz

Video Format Preference Data Block:
- VTDB 1
- VIC 97: 3840x2160  60.000000 Hz  16:9  135.000 kHz  594.000000 MHz
- VIC 114: 3840x2160  60.000000 Hz  16:9  108.000 kHz  594.000000 MHz
- DTD 1
- DTD 3
- DMT 0x48
- VTDB 2
- RID 7@60p

Native Video Resolution Data Block:
- VTDB 1
Preferred Video Timing if only Block 0 is parsed:

<table>
<thead>
<tr>
<th>DTD</th>
<th>Resolution</th>
<th>Refresh Rate</th>
<th>Aspect Ratio</th>
<th>Horizontal Frequency</th>
<th>Vertical Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3840x2160</td>
<td>60.000000 Hz</td>
<td>16:9</td>
<td>135.000 kHz</td>
<td>594.000000 MHz</td>
</tr>
</tbody>
</table>

Preferred Video Timings if Block 0 and CTA-861 Blocks are parsed:

<table>
<thead>
<tr>
<th>DTD</th>
<th>Resolution</th>
<th>Refresh Rate</th>
<th>Aspect Ratio</th>
<th>Horizontal Frequency</th>
<th>Vertical Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3840x2160</td>
<td>60.000000 Hz</td>
<td>16:9</td>
<td>135.000 kHz</td>
<td>594.000000 MHz</td>
</tr>
<tr>
<td>VIC</td>
<td>97: 3840x2160</td>
<td>60.000000 Hz</td>
<td>16:9</td>
<td>135.000 kHz</td>
<td>594.000000 MHz</td>
</tr>
</tbody>
</table>

Preferred Video Timings if Block 0 and CTA-861 Blocks are parsed with VFPDB support:

<table>
<thead>
<tr>
<th>VTDB</th>
<th>Resolution</th>
<th>Refresh Rate</th>
<th>Aspect Ratio</th>
<th>Horizontal Frequency</th>
<th>Vertical Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5120x2160</td>
<td>60.000000 Hz</td>
<td>1:1</td>
<td>133.320 kHz</td>
<td>693.264000 MHz     (&gt;=CTA-861-H)</td>
</tr>
<tr>
<td>VIC</td>
<td>97: 3840x2160</td>
<td>60.000000 Hz</td>
<td>16:9</td>
<td>135.000 kHz</td>
<td>594.000000 MHz</td>
</tr>
<tr>
<td>VIC</td>
<td>114: 3840x2160</td>
<td>48.000000 Hz</td>
<td>16:9</td>
<td>135.000 kHz</td>
<td>594.000000 MHz</td>
</tr>
</tbody>
</table>

Native Video Resolution if only Block 0 is parsed:

3840x2160

Native Video Resolution if Block 0 and CTA-861 Blocks are parsed:

3840x2160

Native Video Resolution if Block 0 and CTA-861 Blocks are parsed with NVRDB support:

5120x2160
Resources

- edid-decode git repository: https://git.linuxtv.org/edid-decode.git
- EDID, E-DDC and DisplayID standards are freely available from https://vesa.org/vesa-standards
- CTA-861 standards are freely available from https://www.cta.tech/Resources/Standards
- email: hverkuil@xs4all.nl
Questions?