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Graphics Feature Status

- Canvas: **Hardware accelerated**
- Flash: **Hardware accelerated**
- Flash Stage3D: **Hardware accelerated**
- Flash Stage3D Baseline profile: **Hardware accelerated**
- Compositing: **Hardware accelerated**
- Multiple Raster Threads: **Disabled**
- Out-of-process Rasterization: **Unavailable**
- Hardware Protected Video Decode: **Unavailable**
- Rasterization: **Unavailable**
- Skia Renderer: **Disabled**
- Video Decode: **Hardware accelerated**
- Viz Display Compositor: **Enabled**
- Viz Hit-test Surface Layer: **Enabled**
- WebGL: **Hardware accelerated**
- WebGL2: **Hardware accelerated**

Driver Bug Workarounds

- clear_uniforms_before_first_program_use
- decode_encode_srgb_for_generatemipmap
- disable_delayed_copy_nv12
- disable_direct_composition_video_overlays
- disable_discard_framebuffer
- disable_dxgi_zero_copy_video
- disable_vp_scaling
- exit_on_context_lost
- force_cube_complete
- scalarize_vec_and_mat_constructor_args
- disabled_extension_GL_KHR_blend_equation_advanced
- disabled_extension_GL_KHR_blend_equation_advanced_coherent

Problems Detected

- GPU rasterization should only be enabled on NVIDIA and Intel and AMD RX-R2 GPUs with DX11+ or any GPU using ANGLE's GL backend.: [643850](#)
*Disabled Features: **gpu_rasterization***
- Protected video decoding with swap chain is for Windows and Intel only
*Disabled Features: **protected_video_decode***
- Some drivers are unable to reset the D3D device in the GPU process sandbox
*Applied Workarounds: **exit_on_context_lost***
- Clear uniforms before first program use on all platforms: [124764](#), [349137](#)
*Applied Workarounds: **clear_uniforms_before_first_program_use***
- Always rewrite vec/mat constructors to be consistent: [398694](#)
*Applied Workarounds: **scalarize_vec_and_mat_constructor_args***
- ANGLE crash on glReadPixels from incomplete cube map texture: [518889](#)
*Applied Workarounds: **force_cube_complete***
- Framebuffer discarding can hurt performance on non-tilers: [570897](#)
*Applied Workarounds: **disable_discard_framebuffer***
- Zero-copy NV12 video displays incorrect colors on NVIDIA drivers.: [635319](#)
*Applied Workarounds: **disable_dxgi_zero_copy_video***

- Disable KHR_blend_equation_advanced until cc shaders are updated: [661715](#)
Applied Workarounds: [disable\(GL_KHR_blend_equation_advanced\)](#), [disable\(GL_KHR_blend_equation_advanced_coherent\)](#)
- Decode and Encode before generateMipmap for srgb format textures on Windows: [634519](#)
Applied Workarounds: [decode_encode_srgb_for_generatemipmap](#)
- Delayed copy NV12 displays incorrect colors on NVIDIA drivers.: [728670](#)
Applied Workarounds: [disable_delayed_copy_nv12](#)
- Hardware overlays result in black videos on non-Intel GPUs: [932879](#)
Applied Workarounds: [disable_direct_composition_video_overlays](#)
- Video processor blit to swap chain results in column of black pixels on older NVIDIA drivers at certain scaling factors: [911349](#)
Applied Workarounds: [disable_direct_composition_video_overlays](#)
- Don't use video processor scaling on non-Intel GPUs.: [993233](#)
Applied Workarounds: [disable_vp_scaling](#)
- Raster is using a single thread.
Disabled Features: [multiple_raster_threads](#)

ANGLE Features

- **disable_program_caching_for_transform_feedback** (Frontend workarounds): **Disabled**
On some GPUs, program binaries don't contain transform feedback varyings
- **lose_context_on_out_of_memory** (Frontend workarounds): **Enabled**: true
Some users rely on a lost context notification if a GL_OUT_OF_MEMORY error occurs
- **scalarize_vec_and_mat_constructor_args** (Frontend workarounds) [398694](#): **Enabled**: true
Always rewrite vec/mat constructors to be consistent
- **sync_framebuffer_bindings_on_tex_image** (Frontend workarounds): **Disabled**
On some drivers TexImage sometimes seems to interact with the Framebuffer
- **add_dummy_texture_no_render_target** (D3D workarounds) [anglebug:2152](#): **Disabled**: isIntel && capsVersion < IntelDriverVersion(4815)
On some drivers when rendering with no render target, two bugs lead to incorrect behavior
- **allow_clear_for_robust_resource_init** (D3D workarounds) [941620](#): **Disabled**: false
Some drivers corrupt texture data when clearing for robust resource initialization.
- **call_clear_twice** (D3D workarounds) [655534](#): **Disabled**: isIntel && isSkylake && capsVersion < IntelDriverVersion(4771)
Using clear() may not take effect
- **depth_stencil_blit_extra_copy** (D3D workarounds) [anglebug:1452](#): **Enabled**: (part1 <= 13u && part2 < 6881) && isNvidia && driverVersionValid
Bug in some drivers triggers a TDR when using CopySubresourceRegion from a staging texture to a depth/stencil
- **disable_b5g6r5_support** (D3D workarounds): **Disabled**: (isIntel && capsVersion < IntelDriverVersion(4539)) || isAMD
Textures with the format DXGI_FORMAT_B5G6R5_UNORM have incorrect data
- **emulate_isnan_float** (D3D workarounds) [650547](#): **Disabled**: isIntel && isSkylake && capsVersion < IntelDriverVersion(4542)
Using isnan() on highp float will get wrong answer
- **emulate_tiny_stencil_textures** (D3D workarounds): **Disabled**: isAMD && ! (deviceCaps.featureLevel < D3D_FEATURE_LEVEL_10_1)
1x1 and 2x2 mips of depth/stencil textures aren't sampled correctly
- **expand_integer_pow_expressions** (D3D workarounds): **Enabled**: true
The HLSL optimizer has a bug with optimizing 'pow' in certain integer-valued expressions
- **flush_after_ending_transform_feedback** (D3D workarounds): **Enabled**: isNvidia
Some drivers sometimes write out-of-order results to StreamOut buffers when transform feedback is used to repeatedly write to the same buffer positions
- **force_atomic_value_resolution** (D3D workarounds) [anglebug:3246](#): **Enabled**: isNvidia
On some drivers the return value from RWByteAddressBuffer.InterlockedAdd does not resolve

when used in the .yzw components of a RWByteAddressBuffer.Store operation

- **get_dimensions_ignores_base_level** (D3D workarounds): **Enabled**: isNvidia
Some drivers do not take into account the base level of the texture in the results of the HLSL GetDimensions builtin
- **mrt_perf_workaround** (D3D workarounds): **Enabled**: true
Some drivers have a bug where they ignore null render targets
- **pre_add_texel_fetch_offsets** (D3D workarounds): **Disabled**: isIntel
HLSL's function texture.Load returns 0 when the parameter Location is negative, even if the sum of Offset and Location is in range
- **rewrite_unary_minus_operator** (D3D workarounds): **Disabled**: isIntel && (isBroadwell || isHaswell) && capsVersion < IntelDriverVersion(4624)
Evaluating unary minus operator on integer may get wrong answer in vertex shaders
- **select_view_in_geometry_shader** (D3D workarounds): **Enabled**: !deviceCaps.supportsVpRtIndexWriteFromVertexShader
The viewport or render target slice will be selected in the geometry shader stage for the ANGLE_multiview extension
- **set_data_faster_than_image_upload** (D3D workarounds): **Enabled**: !(isIvyBridge || isBroadwell || isHaswell)
Set data faster than image upload
- **skip_vs_constant_register_zero** (D3D workarounds): **Enabled**: isNvidia
In specific cases the driver doesn't handle constant register zero correctly
- **use_instanced_point_sprite_emulation** (D3D workarounds): **Disabled**: isFeatureLevel9_3
Some D3D11 renderers do not support geometry shaders for pointsprite emulation
- **use_system_memory_for_constant_buffers** (D3D workarounds) [593024](#): **Disabled**: isIntel
Copying from staging storage to constant buffer storage does not work
- **zero_max_lod** (D3D workarounds): **Disabled**: isFeatureLevel9_3
Missing an option to disable mipmaps on a mipmapped texture

Version Information

Data exported	2020-01-18T21:29:55.205Z
Chrome version	Chrome/79.0.3945.88
Operating system	Windows NT 10.0.18363
Software rendering list URL	https://chromium.googlesource.com/chromium/src/+c2a58a36b9411c80829
Driver bug list URL	https://chromium.googlesource.com/chromium/src/+c2a58a36b9411c80829
ANGLE commit id	48aa52f7305a
2D graphics backend	Skia/79 64f0af0f6548f7b8c45e7e3b2630e34deb04c1aa
Command Line	"C:\Program Files (x86)\Google\Chrome\Application\chrome.exe" --enable-audio-service-sandbox --profile-directory=Default --flag-switches-begin --enable-webgl-draft-extensions --enable-webgl2-compute-context --use-angle=d3d11 --flag-switches-end --enable-audio-service-sandbox

Driver Information

Initialization time	297
In-process GPU	false
Passthrough Command Decoder	true
Sandboxed	true
GPU0	VENDOR= 0x10de, DEVICE=0x0407, SUBSYS=0x43271462, REV=161 *ACTIVE*

GPU1	VENDOR= 0x1414, DEVICE=0x008c
Optimus	false
AMD switchable	false
Desktop compositing	Aero Glass
Direct composition	true
Supports overlays	false
YUY2 overlay support	NONE
NV12 overlay support	NONE
Diagonal Monitor Size of \\.\DISPLAY1	16.9"
Driver D3D12 feature level	Not supported
Driver Vulkan API version	Not supported
Driver vendor	ANGLE (NVIDIA)
Driver version	21.21.13.4201
GPU CUDA compute capability major version	0
Pixel shader version	4.0
Vertex shader version	4.0
Max. MSAA samples	8
Machine model name	
Machine model version	
GL_VENDOR	Google Inc.
GL_RENDERER	ANGLE (NVIDIA GeForce 8600M GT Direct3D11 vs_4_0 ps_4_0)
GL_VERSION	OpenGL ES 2.0.0 (ANGLE 2.1.0.48aa52f7305a)
GL_EXTENSIONS	GL_ANGLE_base_vertex_base_instance GL_ANGLE_client_arrays GL_ANGLE_depth_texture GL_ANGLE_explicit_context GL_ANGLE_explicit_context_gles1 GL_ANGLE_framebuffer_blit GL_ANGLE_framebuffer_multisample GL_ANGLE_instanced_arrays GL_ANGLE_lossy_etc_decode GL_ANGLE_memory_size GL_ANGLE_multi_draw GL_ANGLE_pack_reverse_row_order GL_ANGLE_program_cache_control GL_ANGLE_provoking_vertex GL_ANGLE_request_extension GL_ANGLE_robust_client_memory GL_ANGLE_texture_compression_dxt3 GL_ANGLE_texture_compression_dxt5 GL_ANGLE_texture_usage GL_ANGLE_translated_shader_source GL_CHROMIUM_bind_generates_resource GL_CHROMIUM_bind_uniform_location GL_CHROMIUM_color_buffer_float_rgb GL_CHROMIUM_color_buffer_float_rgba GL_CHROMIUM_copy_compressed_texture GL_CHROMIUM_copy_texture GL_CHROMIUM_lose_context GL_CHROMIUM_sync_query GL_EXT_blend_func_extended GL_EXT_blend_minmax GL_EXT_color_buffer_half_float GL_EXT_debug_marker GL_EXT_discard_framebuffer GL_EXT_disjoint_timer_query GL_EXT_draw_buffers GL_EXT_float_blend GL_EXT_frag_depth GL_EXT_instanced_arrays GL_EXT_map_buffer_range GL_EXT_multisampled_render_to_texture

	GL_EXT_occlusion_query_boolean GL_EXT_read_format_bgra GL_EXT_robustness GL_EXT_sRGB GL_EXT_shader_texture_lod GL_EXT_texture_compression_dxt1 GL_EXT_texture_compression_s3tc_srgb GL_EXT_texture_filter_anisotropic GL_EXT_texture_format_BGRA8888 GL_EXT_texture_rg GL_EXT_texture_storage GL_EXT_unpack_subimage GL_KHR_debug GL_KHR_parallel_shader_compile GL_NV_EGL_stream_consumer_external GL_NV_fence GL_NV_pack_subimage GL_NV_pixel_buffer_object GL_OES_EGL_image GL_OES_EGL_image_external GL_OES_compressed_EAC_R11_signed_texture GL_OES_compressed_EAC_R11_unsigned_texture GL_OES_compressed_EAC_RG11_signed_texture GL_OES_compressed_EAC_RG11_unsigned_texture GL_OES_compressed_ETC2_RGB8_texture GL_OES_compressed_ETC2_RGBA8_texture GL_OES_compressed_ETC2_punchthroughA_RGBA8_texture GL_OES_compressed_ETC2_punchthroughA_sRGB8_alpha_texture GL_OES_compressed_ETC2_sRGB8_alpha8_texture GL_OES_compressed_ETC2_sRGB8_texture GL_OES_depth24 GL_OES_depth32 GL_OES_element_index_uint GL_OES_get_program_binary GL_OES_mapbuffer GL_OES_packed_depth_stencil GL_OES_rgb8_rgba8 GL_OES_standard_derivatives GL_OES_surfaceless_context GL_OES_texture_3D GL_OES_texture_border_clamp GL_OES_texture_float GL_OES_texture_float_linear GL_OES_texture_half_float GL_OES_texture_half_float_linear GL_OES_texture_npot GL_OES_vertex_array_object
Disabled Extensions	GL_KHR_blend_equation_advanced GL_KHR_blend_equation_advanced_coherent
Disabled WebGL Extensions	
Window system binding vendor	Google Inc. (adapter LUID: 00000000000006ab9)
Window system binding version	1.4 (ANGLE 2.1.0.48aa52f7305a)
Window system binding extensions	EGL_EXT_create_context_robustness EGL_ANGLE_d3d_share_handle_client_buffer EGL_ANGLE_d3d_texture_client_buffer EGL_ANGLE_surface_d3d_texture_2d_share_handle EGL_ANGLE_query_surface_pointer EGL_ANGLE_window_fixed_size EGL_ANGLE_keyed_mutex EGL_ANGLE_surface_orientation EGL_ANGLE_direct_composition EGL_ANGLE_windows_ui_composition EGL_NV_post_sub_buffer EGL_KHR_create_context EGL_EXT_device_query EGL_KHR_image EGL_KHR_image_base EGL_KHR_gl_texture_2D_image EGL_KHR_gl_texture_cubemap_image EGL_KHR_gl_renderbuffer_image EGL_KHR_get_all_proc_addresses EGL_KHR_stream EGL_KHR_stream_consumer_gltexture EGL_NV_stream_consumer_gltexture_yuv EGL_ANGLE_flexible_surface_compatibility EGL_ANGLE_stream_producer_d3d_texture EGL_ANGLE_create_context_webgl_compatibility EGL_CHROMIUM_create_context_bind_generates_resource

	EGL_CHROMIUM_sync_control EGL_EXT_pixel_format_float EGL_KHR_surfaceless_context EGL_ANGLE_display_texture_share_group EGL_ANGLE_create_context_client_arrays EGL_ANGLE_program_cache_control EGL_ANGLE_robust_resource_initialization EGL_ANGLE_create_context_extensions_enabled EGL_ANDROID_blob_cache EGL_ANDROID_recordable EGL_ANGLE_image_d3d11_texture EGL_ANGLE_create_context_backwards_compatible
Direct rendering version	unknown
Reset notification strategy	0x8252
GPU process crash count	0
gfx::BufferFormats supported for allocation and texturing	R_8: not supported, R_16: not supported, RG_88: not supported, BGR_565: not supported, RGBA_4444: not supported, RGBX_8888: not supported, RGBA_8888: not supported, BGRX_8888: not supported, BGRX_1010102: not supported, RGBX_1010102: not supported, BGRA_8888: not supported, RGBA_F16: not supported, YVU_420: not supported, YUV_420_BIPLANAR: not supported, P010: not supported

Compositor Information

Tile Update Mode	One-copy
Partial Raster	Enabled

GpuMemoryBuffers Status

R_8	Software only
R_16	Software only
RG_88	Software only
BGR_565	Software only
RGBA_4444	Software only
RGBX_8888	GPU_READ, SCANOUT
RGBA_8888	GPU_READ, SCANOUT
BGRX_8888	Software only
BGRX_1010102	Software only
RGBX_1010102	Software only
BGRA_8888	Software only
RGBA_F16	Software only
YVU_420	Software only
YUV_420_BIPLANAR	Software only
P010	Software only

Display(s) Information

Info	Display[2528732444] bounds=[0,0 1680x1050], workarea=[0,0 1680x1010], scale=1, external.
Color space information	{primaries:BT709, transfer:IEC61966_2_1, matrix:RGB, range:FULL}

SDR white level in nits	80
Bits per color component	8
Bits per pixel	24
Refresh Rate in Hz	59

Video Acceleration Information

Decode h264 baseline	48x48 to 1920x1088 pixels
Decode h264 baseline	48x48 to 1088x1920 pixels
Decode h264 main	48x48 to 1920x1088 pixels
Decode h264 main	48x48 to 1088x1920 pixels
Decode h264 high	48x48 to 1920x1088 pixels
Decode h264 high	48x48 to 1088x1920 pixels
Encode h264 baseline	0x0 to 3840x2176 pixels, and/or 30.000 fps
Encode h264 main	0x0 to 3840x2176 pixels, and/or 30.000 fps
Encode h264 high	0x0 to 3840x2176 pixels, and/or 30.000 fps

Diagnostics

0	
b3DAccelerationEnable	true
b3DAccelerationExists	true
bAGPEnabled	true
bAGPExistenceValid	true
bAGPExists	true
bCanRenderWindow	true
bDDAccelerationEnable	true
bDriverBeta	false
bDriverDebug	false
bDriverSigned	false
bDriverSignedValid	false
bNoHardware	false
dwBpp	32
dwDDIVersion	11
dwHeight	1050
dwRefreshRate	59
dwWHQLLevel	0
dwWidth	1680
iAdapter	0
IDriverSize	17722448
IMiniVddSize	0
szAGPStatusEnglish	Enabled
szAGPStatusLocalized	Enabled
szChipType	GeForce 8600M GT
szD3DStatusEnglish	Enabled
szD3DStatusLocalized	Enabled

szDACType	Integrated RAMDAC
szDDIVersionEnglish	11.1
szDDIVersionLocalized	11.1
szDDStatusEnglish	Enabled
szDDStatusLocalized	Enabled
szDXVAHDEnglish	Supported
szDXVAModes	ModeMPEG2_A ModeMPEG2_C ModeVC1_C ModeWMV9_C
szDescription	NVIDIA GeForce 8600M GT
szDeviceId	0x0407
szDeviceIdentifier	{D7B71E3E-4747-11CF-BB67-2A631BC2D835}
szDeviceName	\\.\DISPLAY1
szDisplayMemoryEnglish	2536 MB
szDisplayMemoryLocalized	2536 MB
szDisplayModeEnglish	1680 x 1050 (32 bit) (59Hz)
szDisplayModeLocalized	1680 x 1050 (32 bit) (59Hz)
szDriverAssemblyVersion	21.21.13.4201
szDriverAttributes	Final Retail
szDriverDateEnglish	11/13/2016 6:00:00 PM
szDriverDateLocalized	11/13/2016 18:00:00
szDriverLanguageEnglish	English
szDriverLanguageLocalized	English
szDriverModelEnglish	WDDM 1.2
szDriverModelLocalized	WDDM 1.2
szDriverName	nvd3dumx.dll,nvwgf2umx.dll,nvwgf2umx.dll
szDriverNodeStrongName	oem1.inf:0f066de34acdc047:Section004:21.21.13.4201:pci\ven_10de&dev_0407
szDriverSignDate	Unknown
szDriverVersion	21.21.0013.4201
szKeyDeviceID	Enum\PCI\VEN_10DE&DEV_0407&SUBSYS_43271462&REV_A1
szKeyDeviceKey	\Registry\Machine\System\CurrentControlSet\Control\Video\{720BC691-1EA6-11EA-8332-ECF2045084B5}\0000
szManufacturer	NVIDIA
szMiniVdd	unknown
szMiniVddDateEnglish	Unknown
szMiniVddDateLocalized	unknown
szMonitorMaxRes	Unknown
szMonitorName	Generic PnP Monitor
szNotesEnglish	No problems found.
szNotesLocalized	No problems found.
szOverlayEnglish	Supported

szRankOfInstalledDriver	00DA0001
szRegHelpText	Unknown
szRevision	Unknown
szRevisionId	0x00A1
szSubSysId	0x43271462
szTestResultD3D7Engli	Not run
szTestResultD3D7Local	Not run
szTestResultD3D8Engli	Not run
szTestResultD3D8Local	Not run
szTestResultD3D9Engli	Not run
szTestResultD3D9Local	Not run
szTestResultDDEnglish	Not run
szTestResultDDLocalize	Not run
szVdd	unknown
szVendorId	0x10DE

Log Messages

- [7800:5100:0118/152951.430:WARNING:angle_platform_impl.cc(52)] : insertMessage(180): GL error: HIGH: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.430:ERROR:gl_utils.cc(325)] : [.WebGL-00000167824FC010] GL_INVALID_OPERATION: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.431:WARNING:angle_platform_impl.cc(52)] : insertMessage(180): GL error: HIGH: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.431:ERROR:gl_utils.cc(325)] : [.WebGL-00000167824FC010] GL_INVALID_OPERATION: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.431:WARNING:angle_platform_impl.cc(52)] : insertMessage(180): GL error: HIGH: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.431:ERROR:gl_utils.cc(325)] : [.WebGL-00000167824FC010] GL_INVALID_OPERATION: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.431:WARNING:angle_platform_impl.cc(52)] : insertMessage(180): GL error: HIGH: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.431:ERROR:gl_utils.cc(325)] : [.WebGL-00000167824FC010] GL_INVALID_OPERATION: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.432:WARNING:angle_platform_impl.cc(52)] : insertMessage(180): GL error: HIGH: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D
- [7800:5100:0118/152951.432:ERROR:gl_utils.cc(325)] : [.WebGL-00000167824FC010] GL_INVALID_OPERATION: Internal D3D11 error: HRESULT: 0x80070057: Error allocating Texture2D

- [illegible]

Texture2D

- GpuProcessHost: The unsandboxed GPU process exited normally. Everything is okay.