

The background of the slide is a deep blue night sky filled with numerous small, bright stars. In the upper right corner, a large, detailed full moon is visible. In the lower left, the dark silhouette of a tree with many branches is shown against the starry sky.

# Creating and Using Vulkan Profiles

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Presented at the Khronos Vulkanised 2023 Conference

<https://www.lunarg.com/news-insights/white-papers/creating-vulkan-profiles-feb2023/>



# Audience questions...

Please, raise your hand if

- You shipped a Vulkan program (tool or application)?
- You have used some of the Vulkan SDK Profiles tools?

# Agenda

- A brief presentation of the Vulkan Profiles
  - A tutorial on how to create and use a Vulkan Profile
- 
- Based on The Vulkan Profiles Toolset solution whitepaper
    - <https://www.lunarg.com/wp-content/uploads/2022/03/The-Vulkan-Profiles-Toolset-Solution-FEB2022.pdf>
  - Slides available on LunarG website
    - <https://www.lunarg.com/news-insights/white-papers/vulkan-sdk-tools-to-use-and-create-vulkan-profiles/>

# Vulkan Profiles

# What's a Vulkan Profile?

- Released with Vulkan 1.3 and Vulkan Roadmap 2022 profile
- An explicit representation of Vulkan Capabilities
  - Extensions
  - Features
  - Properties
  - Queue properties
  - Formats
  - Etc...
- A solution to communicate about Vulkan capabilities requirement or support
- A solution to make it easier to create more portable Vulkan programs

# Vulkan Profiles usages:

- Roadmap profiles:
  - To express guidance on the future direction of Vulkan devices or projects.
  - Eg: Vulkan Roadmap 2022 profile.
- Platform profiles:
  - To express the minimum level of Vulkan capabilities support of a platform.
  - Eg: [Android Baseline 2021 and 2022](#), LunarG Desktop Baseline 2022 profile.
- Device profiles:
  - To express the Vulkan support of a single Vulkan driver for a Vulkan device.
  - Eg: [GPUinfo.org reports](#) and vulkaninfo.
- Engine profiles:
  - To express some rendering code paths requirements of an engine.
  - Eg: Zink OpenGL 4.6 Optimal profile, DXVK D3D11 Level 11.1 Baseline profile
- Etc.

# Creating and using a Vulkan Profile

# A scenario for this tutorial:

- Our Vulkan application currently requires LunarG Desktop Baseline 2022 profile, a Vulkan 1.1-based profile
- MoltenVK was upgraded to Vulkan 1.2
- We want to upgrade our application to Vulkan 1.2 as a minimum requirement to simplify our code and support
- We want to create a new profile called “LunarG Desktop Baseline 2023” which requires Vulkan 1.2





## Listing all devices

All platforms

Windows

Linux

Android

macOS

iOS

Type to filter	1.2	Type to filter			
Device	Max. API version	Latest Driver version	Last submission	Count	Compare
AMD RADV OVERRIDDEN	1.2.182	21.2.6	2023-01-30 16:09:20	1	<a href="#">Add</a>
Intel(R) HD Graphics P4600/P4700 (HSW GT2)	1.2.230	22.3.3	2023-01-30 03:39:50	1	<a href="#">Add</a>
Quadro K2100M	1.2.175	470.161.3.0	2023-01-29 22:07:23	4	<a href="#">Add</a>
NVIDIA GeForce GTX 660	1.2.175	474.14.0.0	2023-01-29 12:14:08	9	<a href="#">Add</a>
GeForce MX150	1.2.155	461.72.0.0	2023-01-29 11:32:21	38	<a href="#">Add</a>
Apple M1 Pro	1.2.236	0.2.2009	2023-01-28 23:51:49	13	<a href="#">Add</a>
NVIDIA GeForce GTX 670	1.2.175	474.4.0.0	2023-01-28 21:48:52	4	<a href="#">Add</a>
samsung SM-A127F	1.1.213	38.1.0	2023-01-28 18:56:21	2	<a href="#">Add</a>
GeForce 920M	1.2.133	450.80.2.0	2023-01-28 18:46:06	12	<a href="#">Add</a>
Apple M1	1.2.236	0.2.2009	2023-01-28 11:25:33	44	<a href="#">Add</a>
Intel(R) Iris(TM) Graphics 6000	1.2.236	0.2.2009	2023-01-28 04:42:19	3	<a href="#">Add</a>
Samsung SM-G980F	1.1.213	38.1.0	2023-01-28 01:46:06	3	<a href="#">Add</a>
rockchip orangepi5	1.1.200	12.0.0	2023-01-27 17:40:13	1	<a href="#">Add</a>



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Type to filter	1.2	Type to filter			
Device	Max. API version	Latest Driver version	Last submission	Count	Compare
AMD RADV OVERRIDDEN	1.2.182	21.2.6	2023-01-30 16:09:20	1	<a href="#">Add</a>
Intel(R) HD Graphics P4600/P4700 (HSW GT2)	1.2.230	22.3.3	2023-01-30 03:39:50	1	<a href="#">Add</a>
Quadro K2100M	1.2.175	470.161.3.0	2023-01-29 22:07:23	4	<a href="#">Add</a>
NVIDIA GeForce GTX 660	1.2.175	474.14.0.0	2023-01-29 12:14:08	9	<a href="#">Add</a>
GeForce MX150	1.2.155	461.72.0.0	2023-01-29 11:32:21	38	<a href="#">Add</a>
Apple M1 Pro	1.2.236	0.2.2009	2023-01-28 23:51:49	13	<a href="#">Add</a>
NVIDIA GeForce GTX 670	1.2.175	474.4.0.0	2023-01-28 21:48:52	4	<a href="#">Add</a>
samsung SM-A127F	1.1.213	38.1.0	2023-01-28 18:56:21	2	<a href="#">Add</a>
GeForce 920M	1.2.133	450.80.2.0	2023-01-28 18:46:06	12	<a href="#">Add</a>
Apple M1	1.2.236	0.2.2009	2023-01-28 11:25:33	44	<a href="#">Add</a>
Intel(R) Iris(TM) Graphics 6000	1.2.236	0.2.2009	2023-01-28 04:42:19	3	<a href="#">Add</a>
Samsung SM-G980F	1.1.213	38.1.0	2023-01-28 01:46:06	3	<a href="#">Add</a>
rockchip orangepi5	1.1.200	12.0.0	2023-01-27 17:40:13	1	<a href="#">Add</a>



## Device report for Apple M1 on macOS

Device

[Properties](#)[Features](#)[Extensions](#) 69[Formats](#) 130[Queue families](#) 1[Memory](#) 4[Surface](#)[Instance](#)[Profiles](#)Search: 

Property	Value
Device	
Name	Apple M1
Driver version	0.2.2009
Type	INTEGRATED_GPU
API Version	1.2.236
Vendor	Apple
Platform	
Name	Osx
Architecture	x86_64
Version	12.6
Report	
Submitted by	Marvin
Submitted at	2022-12-25 13:41:40
Reportversion	3.2



Property	Value
Device	
Name	Apple M1
Driver version	0.2.2009
Type	INTEGRATED_GPU
API Version	1.2.236
Vendor	Apple
Platform	
Name	Osx
Architecture	x86_64
Version	12.6
Report	
Submitted by	Marvin
Submitted at	2022-12-25 13:41:40
Reportversion	3.2
Description	MBP M1 2021
Profile JSON [?] Full JSON profile	



Listing listing all reports on Windows

All platforms

Windows

Linux

Android

macOS

iOS

	530	Type to filter	1.2	INTEL	Type to filter	Type to filter	Type to filter		
id	Device	Driver	Api	Vendor	Type	OS	Version	Platform	Compare
15445	Intel(R) HD Graphics 530	100.8854	1.2.151	INTEL	integrated	windows	10	x86_64	Add
14731	Intel(R) HD Graphics 530	101.1631	1.2.205	INTEL	integrated	windows	10	x86_64	Add
14457	Intel(R) HD Graphics 530	101.1221	1.2.199	INTEL	integrated	windows	10	x86_64	Add
14450	Intel(R) HD Graphics 530	101.1404	1.2.204	INTEL	integrated	windows	10	x86_64	Add
14069	Intel(R) HD Graphics 530	101.1340	1.2.203	INTEL	integrated	windows	10	x86_64	Add
14005	Intel(R) HD Graphics 530	101.1219	1.2.199	INTEL	integrated	windows	10	x86_64	Add
13695	Intel(R) HD Graphics 530	101.1192	1.2.197	INTEL	integrated	windows	10	x86_64	Add
13660	Intel(R) HD Graphics 530	100.9416	1.2.170	INTEL	integrated	windows	10	x86_64	Add
13435	Intel(R) HD Graphics 530	101.9999	1.2.200	INTEL	integrated	windows	10	x86_64	Add
13434	Intel(R) HD Graphics 530	101.1122	1.2.196	INTEL	integrated	windows	10	x86_64	Add
13427	Intel(R) HD Graphics 530	101.1191	1.2.197	INTEL	integrated	windows	10	x86_64	Add
13425	Intel(R) HD Graphics 530	101.1070	1.2.195	INTEL	integrated	windows	10	x86_64	Add
13163	Intel(R) HD Graphics 530	100.8142	1.2.135	INTEL	integrated	windows	10	x86_64	Add

File Explorer window showing the directory structure of the Vulkan SDK 1.3.236.0. The address bar shows the path: `E:\VulkanSDK\1.3.236.0\share\vulkan\registry\VK_LUNARG_desktop_baseline_2023`.

The left sidebar shows the directory tree, with the current path expanded: `Source (E:) > VulkanSDK > 1.3.236.0 > share > vulkan > registry > VK_LUNARG_desktop_baseline_2023`.

The main pane displays a list of files in the current directory, sorted by Name. The files are all JSON files, representing GPU information for various hardware configurations.

Name	Date modified	Type	Size
vp_gpuinfo_amd_radeon_pro_vega_48_0_2_2009_osx_13_1.json	25/01/2023 11:31	JSON File	164 KB
vp_gpuinfo_amd_radeon_r7_200_series_2_0_179_windows_10.json	30/01/2023 15:26	JSON File	203 KB
vp_gpuinfo_amd_radv_pitcairn_21_2_1_arch_unknown.json	30/01/2023 15:27	JSON File	189 KB
vp_gpuinfo_apple_m1_0_2_2009_osx_12_6.json	25/01/2023 11:31	JSON File	161 KB
vp_gpuinfo_intel_r_hd_graphics_520_0_402_1274_windows_10.json	30/01/2023 15:26	JSON File	197 KB
vp_gpuinfo_intel_r_hd_graphics_530_skl_gt2_21_1_99_ubuntu_21_02.json	30/01/2023 15:27	JSON File	229 KB
vp_gpuinfo_intel_r_uhd_graphics_630_0_2_2009_osx_13_2.json	25/01/2023 11:30	JSON File	163 KB
vp_gpuinfo_nvidia_geforce_gtx_650_ti_474_4_0_0_windows_10.json	30/01/2023 15:26	JSON File	196 KB
vp_gpuinfo_nvidia_geforce_gtx_660_470_161_3_0_ubuntu_22_04.json	30/01/2023 15:27	JSON File	205 KB
vp_gpuinfo_nvidia_geforce_gtx_680mx_0_0_159_24_osx_10_15.json	25/01/2023 11:28	JSON File	153 KB



File Explorer window showing the directory structure of the Vulkan SDK 1.3.236.0 share folder.

Address bar: E:\VulkanSDK\1.3.236.0\share\vulkan\registry

Navigation pane (Left):

- 1.3.224.1 - dev
- 1.3.231.1
- 1.3.235.0 - tmp
- 1.3.236.0
  - Bin
  - Config
  - Demos
  - Helpers
  - Include
  - installerResources
  - Lib
  - Licenses
  - share
    - vulkan
      - registry (selected)
      - \_\_pycache\_\_
      - VK\_LUNARG\_desktop\_baseline\_...
  - Source
  - Templates

Main pane (Right) - Registry contents:

Name	Date modified	Type	Size
__pycache__	30/01/2023 17:10	File folder	
VK_LUNARG_desktop_baseline_2023	30/01/2023 17:02	File folder	
gen_profiles_file.py	13/12/2022 18:20	JetBrains PyCharm ...	45 KB
gen_profiles_solution.py	13/12/2022 18:20	JetBrains PyCharm ...	215 KB
profiles-0.8-latest.json	13/12/2022 18:20	JSON File	358 KB
validusage.json	13/12/2022 18:20	JSON File	5 978 KB
video.xml	13/12/2022 18:20	XML Document	116 KB
vk.xml	13/12/2022 18:20	XML Document	2 085 KB

Status bar: 8 items | 1 item selected 44,3 KB

```
MINGW64:/e/VulkanSDK/1.3.236.0/share/vulkan/registry
Piranha@Piranha MINGW64 /e/vulkanSDK/1.3.236.0/share/vulkan/registry
$ python gen_profiles_file.py --registry vk.xml --input ./VK_LUNARG_desktop_baseline_2023/ -o VK_LUNARG_desktop_baseline_2023.json --profile-desc "Portable
profile for desktop devices" --profile-label "Lunarg Desktop Baseline 2023"
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_amd_radeon_pro_vega_48_0_2_2009_osx_13_1.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_amd_radeon_r7_200_series_2_0_179_windows_10.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_amd_radv_pitcairn_21_2_1_arch_unknown.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_apple_m1_0_2_2009_osx_12_6.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_intel_r_hd_graphics_520_0_402_1274_windows_10.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_intel_r_hd_graphics_530_skl_gt2_21_1_99_ubuntu_21_02.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_intel_r_uhd_graphics_630_0_2_2009_osx_13_2.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_nvidia_geforce_gtx_650_ti_474_4_0_0_windows_10.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_nvidia_geforce_gtx_660_470_161_3_0_ubuntu_22_04.json
Opening: ./VK_LUNARG_desktop_baseline_2023//vp_gpuinfo_nvidia_geforce_gtx_680mx_0_0_159_24_osx_10_15.json
Loading registry file: 'vk.xml'
Building a Vulkan 1.2.170 profile
Piranha@Piranha MINGW64 /e/vulkanSDK/1.3.236.0/share/vulkan/registry
$ |
```



E:\VulkanSDK\1.3.236.0\share\vulkan\registry

Home Share View

← → ↕

> This PC > Source (E:) > VulkanSDK > 1.3.236.0 > share > vulkan > registry

Search registry

Name	Date modified	Type	Size
1.3.224.1 - dev			
1.3.231.1			
1.3.235.0 - tmp			
1.3.236.0			
Bin			
Config			
Demos			
Helpers			
Include			
installerResources			
Lib			
Licenses			
share			
vulkan			
registry			
__pycache__			
VK_LUNARG_desktop_baseline_2023			
Source			
Templates			
__pycache__	30/01/2023 17:10	File folder	
VK_LUNARG_desktop_baseline_2023	30/01/2023 17:02	File folder	
gen_profiles_file.py	13/12/2022 18:20	JetBrains PyCharm ...	45 KB
gen_profiles_solution.py	13/12/2022 18:20	JetBrains PyCharm ...	215 KB
profiles-0.8-latest.json	13/12/2022 18:20	JSON File	358 KB
validusage.json	13/12/2022 18:20	JSON File	5 978 KB
video.xml	13/12/2022 18:20	XML Document	116 KB
vk.xml	13/12/2022 18:20	XML Document	2 085 KB
VK_LUNARG_desktop_baseline_2023.json	30/01/2023 17:14	JSON File	102 KB

9 items | 1 item selected 101 KB

File Explorer window showing the directory structure of the Vulkan SDK 1.3.236.0 share folder.

Address bar: E:\VulkanSDK\1.3.236.0\share\vulkan\registry

Navigation pane (Left):

- 1.3.224.1 - dev
- 1.3.231.1
- 1.3.235.0 - tmp
- 1.3.236.0
  - Bin
  - Config
  - Demos
  - Helpers
  - Include
  - installerResources
  - Lib
  - Licenses
  - share
    - vulkan
      - registry (Selected)
      - \_\_pycache\_\_
      - VK\_LUNARG\_desktop\_baseline\_2023
  - Source
  - Templates

Main pane (Right):

Name	Date modified	Type	Size
__pycache__	30/01/2023 17:10	File folder	
VK_LUNARG_desktop_baseline_2023	30/01/2023 17:02	File folder	
gen_profiles_file.py	13/12/2022 18:20	JetBrains PyCharm ...	45 KB
gen_profiles_solution.py	13/12/2022 18:20	JetBrains PyCharm ...	215 KB
profiles-0.8-latest.json	13/12/2022 18:20	JSON File	358 KB
validusage.json	13/12/2022 18:20	JSON File	5 978 KB
video.xml	13/12/2022 18:20	XML Document	116 KB
vk.xml	13/12/2022 18:20	XML Document	2 085 KB
VK_LUNARG_desktop_baseline_2023.json	30/01/2023 17:14	JSON File	102 KB

Status bar: 9 items | 1 item selected 357 KB

An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.

View source code

Select schema:

Custom

Profiles Schema

```
1 {
2   "$schema": "http://json-schema.org/draft-07/schema#",
3   "$id": "https://schema.khronos.org/vulkan/profiles-0.8.1-236.json#",
4   "title": "Vulkan Profiles Schema for Vulkan 1.3.236",
5   "additionalProperties": true,
6   "required": [
7     "capabilities",
8     "profiles"
9   ],
10  "definitions": {
11    "status": {
12      "description": "The development status of the
13      setting. When missing, this property is inherited
14      from parent nodes. If no parent node defines it,
15      the default value is 'STABLE'.",
16      "type": "string",
17      "enum": [
18        "ALPHA",
19        "BETA",
20        "STABLE",
21        "DEPRECATED"
22      ]
23    },
24    "contributor": {
25      "type": "object",
26      "additionalProperties": false,
27      "required": [
```

Input JSON: VP\_LUNARG\_desktop\_baseline\_2023

```
1 {
2   "$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-170.json#",
3   "capabilities": {
4     "baseline": {
5       "extensions": {
6         "VK_EXT_descriptor_indexing": 2,
7         "VK_EXT_host_query_reset": 1,
8         "VK_EXT_image_robustness": 1,
9         "VK_EXT_inline_uniform_block": 1,
10        "VK_EXT_memory_budget": 1,
11        "VK_EXT_robustness2": 1,
12        "VK_EXT_subgroup_size_control": 2,
13        "VK_EXT_texel_buffer_alignment": 1,
14        "VK_EXT_vertex_attribute_divisor": 3,
15        "VK_KHR_16bit_storage": 1,
16        "VK_KHR_8bit_storage": 1,
17        "VK_KHR_bind_memory2": 1,
18        "VK_KHR_create_renderpass2": 1,
19        "VK_KHR_dedicated_allocation": 3,
20        "VK_KHR_depth_stencil_resolve": 1,
21        "VK_KHR_descriptor_update_template": 1,
22        "VK_KHR_device_group": 4,
23        "VK_KHR_driver_properties": 1,
24        "VK_KHR_external_fence": 1,
25        "VK_KHR_external_memory": 1,
26        "VK_KHR_external_semaphore": 1,
27        "VK_KHR_get_memory_requirements2": 1.
```

✓ No errors found. JSON validates against the schema

An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.

[View source code](#)

Select schema:

Custom

Input JSON:

```
1 {
2   "$schema": "http://json-schema.org/draft-07/schema#",
3   "$id": "https://schema.khronos.org/vulkan/profiles-0.8.1-236.json#",
4   "title": "Vulkan Profiles Schema for Vulkan 1.3.236",
5   "additionalProperties": true,
6   "required": [
7     "capabilities",
8     "profiles"
9   ],
10  "definitions": {
11    "status": {
12      "description": "The development status of the setting. When missing, this property is inherited from parent nodes. If no parent node defines it, the default value is 'STABLE'.",
13      "type": "string",
14      "enum": [
15        "ALPHA",
16        "BETA",
17        "STABLE",
18        "DEPRECATED"
19      ]
20    },
21    "contributor": {
22      "type": "object",
23      "additionalProperties": false,
24      "required": [
```

```
1 {
2   "$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-170.json#",
3   "capabilities": {
4     "baseline": {
5       "extensions": {
6         "VK_EXT_descriptor_indexing": 2,
7         "VK_EXT_host_query_reset": 1,
8         "VK_EXT_image_robustness": 1,
9         "VK_EXT_inline_uniform_block": 1,
10        "VK_EXT_memory_budget": 1,
11        "VK_EXT_robustness2": 1,
12        "VK_EXT_subgroup_size_control": 2,
13        "VK_EXT_texel_buffer_alignment": 1,
14        "VK_EXT_vertex_attribute_divisor": 3,
15        "VK_KHR_16bit_storage": 1,
16        "VK_KHR_8bit_storage": 1,
17        "VK_KHR_bind_memory2": 1,
18        "VK_KHR_create_renderpass2": 1,
19        "VK_KHR_dedicated_allocation": 3,
20        "VK_KHR_depth_stencil_resolve": 1,
21        "VK_KHR_descriptor_update_template": 1,
22        "VK_KHR_device_group": 4,
23        "VK_KHR_driver_properties": 1,
24        "VK_KHR_external_fence": 1,
25        "VK_KHR_external_memory": 1,
26        "VK_KHR_external_semaphore": 1,
27        "VK_KHR_get_memory_requirements2": 1.
```

The required schema versions don't match,

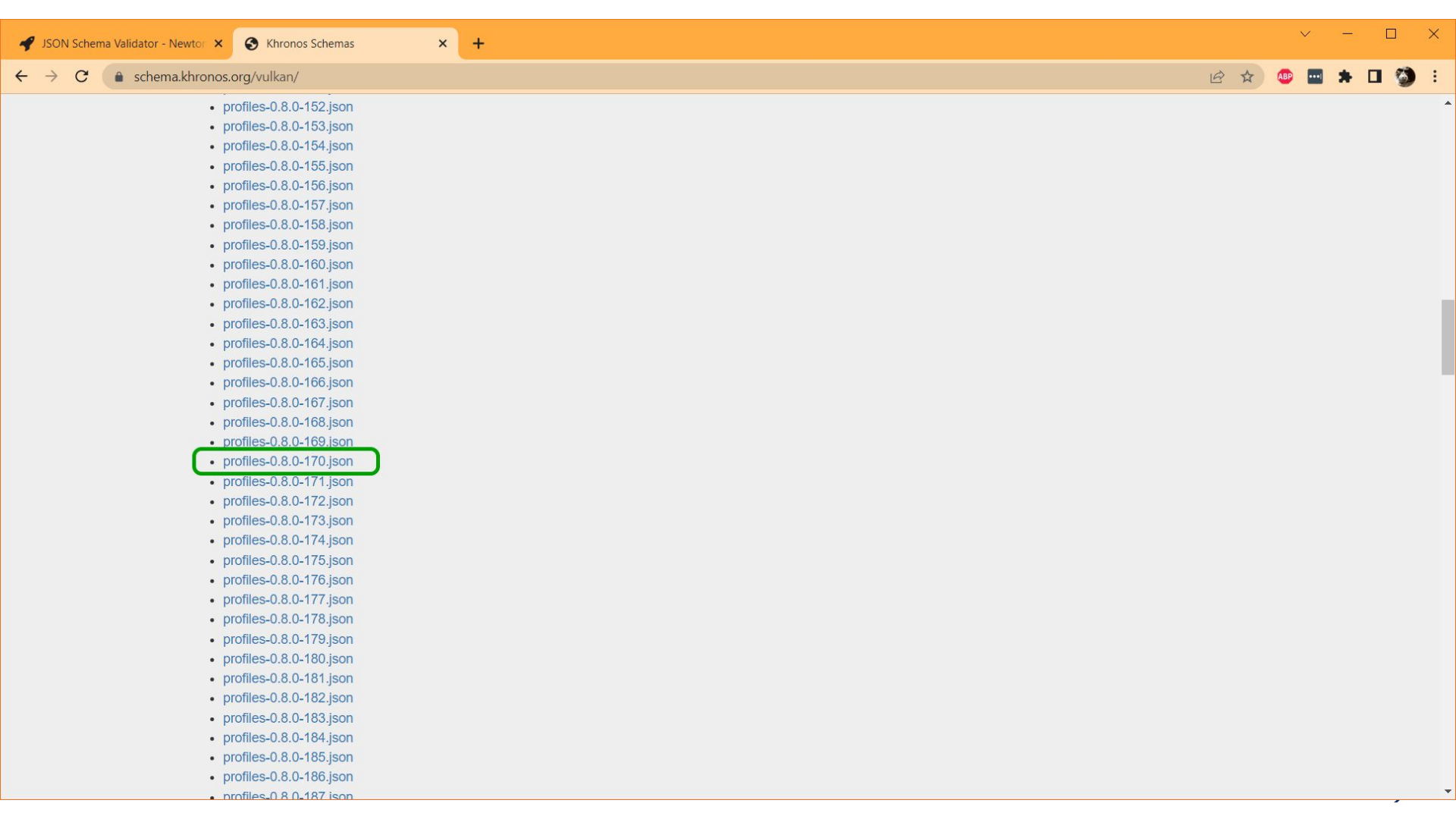
the profile could use unreleased capabilities at the time of Vulkan Header 170 release



# Khronos Schemas - Vulkan

Home Model 3D Vulkan

- devsim\_1\_0\_0.json
- devsim\_1\_1\_0.json
- devsim\_1\_2\_0.json
- devsim\_VK\_EXT\_descriptor\_indexing\_1.json
- devsim\_VK\_EXT\_host\_query\_reset\_1.json
- devsim\_VK\_EXT\_sampler\_filter\_minmax\_1.json
- devsim\_VK\_EXT\_scalar\_block\_layout\_1.json
- devsim\_VK\_KHR\_16bit\_storage\_1.json
- devsim\_VK\_KHR\_8bit\_storage\_1.json
- devsim\_VK\_KHR\_buffer\_device\_address\_1.json
- devsim\_VK\_KHR\_depth\_stencil\_resolve\_1.json
- devsim\_VK\_KHR\_imageless\_framebuffer\_1.json
- devsim\_VK\_KHR\_maintenance2\_1.json
- devsim\_VK\_KHR\_maintenance3\_1.json
- devsim\_VK\_KHR\_multiview\_1.json
- devsim\_VK\_KHR\_portability\_subset-provisional-1.json
- devsim\_VK\_KHR\_sampler\_ycbcr\_conversion\_1.json
- devsim\_VK\_KHR\_separate\_depth\_stencil\_layouts\_1.json
- devsim\_VK\_KHR\_shader\_atomic\_int64\_1.json
- devsim\_VK\_KHR\_shader\_float16\_int8\_1.json
- devsim\_VK\_KHR\_shader\_float\_controls\_1.json
- devsim\_VK\_KHR\_shader\_subgroup\_extended\_types\_1.json
- devsim\_VK\_KHR\_timeline\_semaphore\_1.json
- devsim\_VK\_KHR\_uniform\_buffer\_standard\_layout\_1.json



- [profiles-0.8.0-152.json](#)
- [profiles-0.8.0-153.json](#)
- [profiles-0.8.0-154.json](#)
- [profiles-0.8.0-155.json](#)
- [profiles-0.8.0-156.json](#)
- [profiles-0.8.0-157.json](#)
- [profiles-0.8.0-158.json](#)
- [profiles-0.8.0-159.json](#)
- [profiles-0.8.0-160.json](#)
- [profiles-0.8.0-161.json](#)
- [profiles-0.8.0-162.json](#)
- [profiles-0.8.0-163.json](#)
- [profiles-0.8.0-164.json](#)
- [profiles-0.8.0-165.json](#)
- [profiles-0.8.0-166.json](#)
- [profiles-0.8.0-167.json](#)
- [profiles-0.8.0-168.json](#)
- [profiles-0.8.0-169.json](#)
- [profiles-0.8.0-170.json](#)
- [profiles-0.8.0-171.json](#)
- [profiles-0.8.0-172.json](#)
- [profiles-0.8.0-173.json](#)
- [profiles-0.8.0-174.json](#)
- [profiles-0.8.0-175.json](#)
- [profiles-0.8.0-176.json](#)
- [profiles-0.8.0-177.json](#)
- [profiles-0.8.0-178.json](#)
- [profiles-0.8.0-179.json](#)
- [profiles-0.8.0-180.json](#)
- [profiles-0.8.0-181.json](#)
- [profiles-0.8.0-182.json](#)
- [profiles-0.8.0-183.json](#)
- [profiles-0.8.0-184.json](#)
- [profiles-0.8.0-185.json](#)
- [profiles-0.8.0-186.json](#)
- [profiles-0.8.0-187.json](#)

An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.

View source code

Select schema: Custom

```
1 {
2   "$schema": "http://json-schema.org/draft-07/schema#",
3   "$id": "https://schema.khronos.org/vulkan/profiles-0.8.1-170.json#",
4   "title": "Vulkan Profiles Schema for Vulkan 1.2.170",
5   "additionalProperties": true,
6   "required": [
7     "capabilities",
8     "profiles"
9   ],
10  "definitions": {
11    "status": {
12      "description": "The development status of the setting. When missing, this property is inherited from parent nodes. If no parent node defines it, the default value is 'STABLE'.",
13      "type": "string",
14      "enum": [
15        "ALPHA",
16        "BETA",
17        "STABLE",
18        "DEPRECATED"
19      ]
20    },
21    "contributor": {
22      "type": "object",
23      "additionalProperties": false,
24      "required": [
```

Input JSON:

```
1 {
2   "$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-170.json#",
3   "capabilities": {
4     "baseline": {
5       "extensions": {
6         "VK_EXT_descriptor_indexing": 2,
7         "VK_EXT_host_query_reset": 1,
8         "VK_EXT_image_robustness": 1,
9         "VK_EXT_inline_uniform_block": 1,
10        "VK_EXT_memory_budget": 1,
11        "VK_EXT_robustness2": 1,
12        "VK_EXT_subgroup_size_control": 2,
13        "VK_EXT_texel_buffer_alignment": 1,
14        "VK_EXT_vertex_attribute_divisor": 3,
15        "VK_KHR_16bit_storage": 1,
16        "VK_KHR_8bit_storage": 1,
17        "VK_KHR_bind_memory2": 1,
18        "VK_KHR_create_renderpass2": 1,
19        "VK_KHR_dedicated_allocation": 3,
20        "VK_KHR_depth_stencil_resolve": 1,
21        "VK_KHR_descriptor_update_template": 1,
22        "VK_KHR_device_group": 4,
23        "VK_KHR_driver_properties": 1,
24        "VK_KHR_external_fence": 1,
25        "VK_KHR_external_memory": 1,
26        "VK_KHR_external_semaphore": 1,
27        "VK_KHR_get_memory_requirements2": 1.
```

✓ No errors found. JSON validates against the schema

An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.

View source code

Select schema:

Custom

```
1 {
2   "$schema": "http://json-schema.org/draft-07/schema#",
3   "$id": "https://schema.khronos.org/vulkan/profiles-0.8.0-147.json#",
4   "title": "Vulkan Profiles Schema for Vulkan 1.2.147",
5   "additionalProperties": true,
6   "required": [
7     "capabilities",
8     "profiles"
9   ],
10  "definitions": {
11    "status": {
12      "description": "The development status of the setting. When
13      missing, this property is inherited from parent nodes. If no
14      parent node defines it, the default value is 'STABLE'.",
15      "type": "string",
16      "enum": [
17        "ALPHA",
18        "BETA",
19        "STABLE",
20        "DEPRECATED"
21      ]
22    },
23    "contributor": {
24      "type": "object",
25      "additionalProperties": false,
26      "required": [
27        "company"
28      ]
29    }
30  },
31  "capabilities": {
32    "profiles": {
33      "status": "STABLE",
34      "description": "The development status of the setting. When
35      missing, this property is inherited from parent nodes. If no
36      parent node defines it, the default value is 'STABLE'.",
37      "type": "string",
38      "enum": [
39        "ALPHA",
40        "BETA",
41        "STABLE",
42        "DEPRECATED"
43      ]
44    }
45  }
46 }
```

Input JSON: ✖ Found 2 error(s)

```
1 {
2   "$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-
3   170.json#",
4   "capabilities": {
5     "baseline": {
6       "extensions": {
7         "VK_EXT_descriptor_indexing": 2,
8         "VK_EXT_host_query_reset": 1,
9         "VK_EXT_image_robustness": 1,
10        "VK_EXT_inline_uniform_block": 1,
11        "VK_EXT_memory_budget": 1,
12        "VK_EXT_robustness2": 1,
13        "VK_EXT_subgroup_size_control": 2,
14        "VK_EXT_texel_buffer_alignment": 1,
15        "VK_EXT_vertex_attribute_divisor": 3,
16        "VK_KHR_16bit_storage": 1,
17        "VK_KHR_8bit_storage": 1,
18        "VK_KHR_bind_memory2": 1,
19        "VK_KHR_create_renderpass2": 1,
20        "VK_KHR_dedicated_allocation": 3,
21        "VK_KHR_depth_stencil_resolve": 1,
22        "VK_KHR_descriptor_update_template": 1,
23        "VK_KHR_device_group": 4,
24        "VK_KHR_driver_properties": 1,
25        "VK_KHR_external_fence": 1,
26        "VK_KHR_external_memory": 1,
27        "VK_KHR_external_semaphore": 1,
28        "VK_KHR_get_memory_requirements2": 1,
29      }
30    }
31  }
32 }
```

✖ Found 2 error(s)

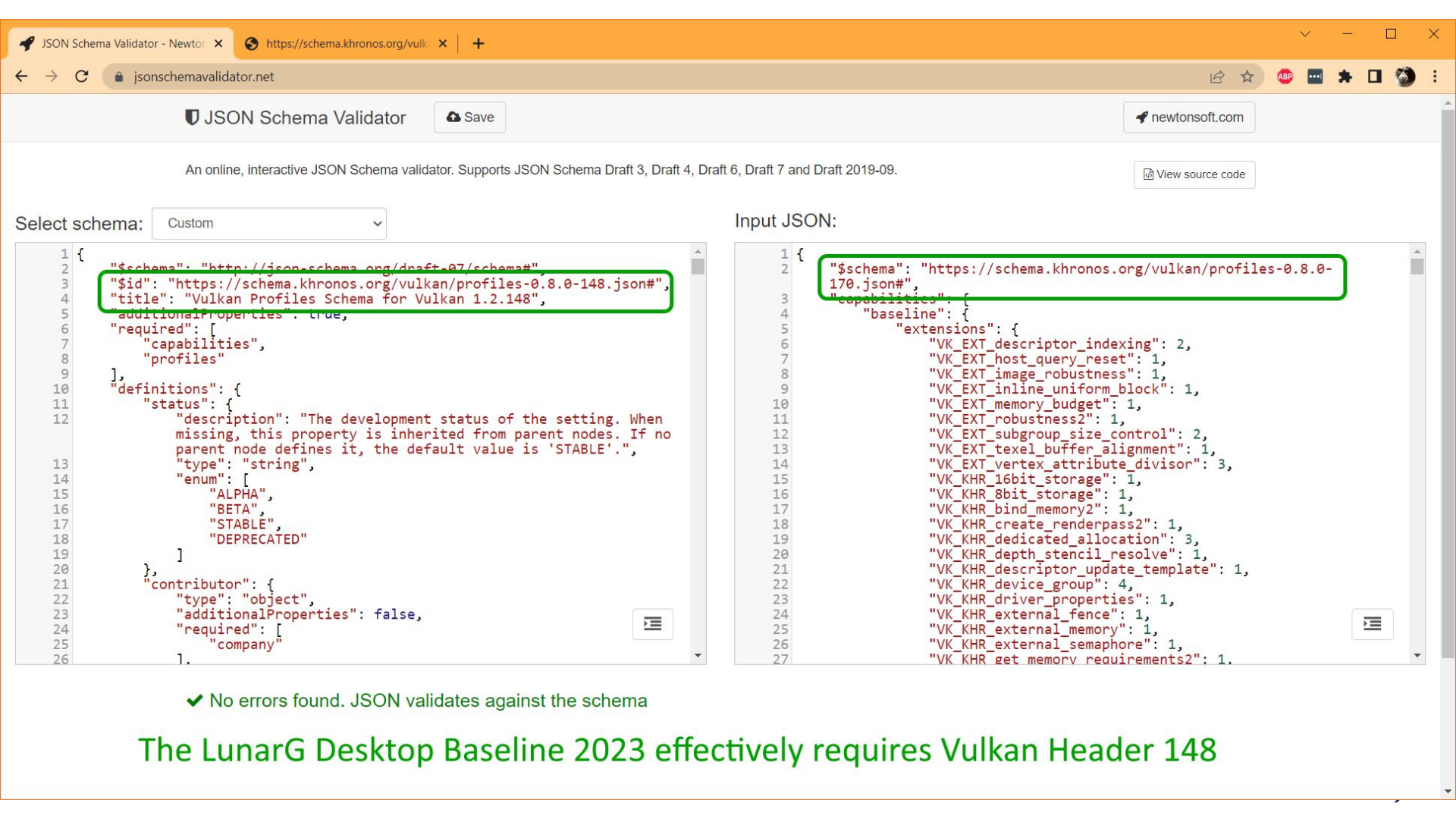
Message:

Property 'VK\_EXT\_image\_robustness' has not been defined and the schema does not allow additional properties.

Schema path:

https://schema.khronos.org/vulkan/profiles-0.8.0-147.json#/properties/capabilities/additionalProperties/properties/extensions/additionalProperties





JSON Schema Validator - Newtor

https://schema.khronos.org/vulk...

+

← → ↺

jsonschemavalidator.net

🔖 ☆ ABP ⚙️ 🖨️ 🔍

JSON Schema Validator

Save

newtonsoft.com

An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.

View source code

Select schema: Custom

```
1 {
2   "$schema": "http://json-schema.org/draft-07/schema#",
3   "$id": "https://schema.khronos.org/vulkan/profiles-0.8.0-148.json#",
4   "title": "Vulkan Profiles Schema for Vulkan 1.2.148",
5   "additionalProperties": true,
6   "required": [
7     "capabilities",
8     "profiles"
9   ],
10  "definitions": {
11    "status": {
12      "description": "The development status of the setting. When
13      missing, this property is inherited from parent nodes. If no
14      parent node defines it, the default value is 'STABLE'.",
15      "type": "string",
16      "enum": [
17        "ALPHA",
18        "BETA",
19        "STABLE",
20        "DEPRECATED"
21      ]
22    },
23    "contributor": {
24      "type": "object",
25      "additionalProperties": false,
26      "required": [
27        "company"
28      ]
29    }
30  }
31 }
```

Input JSON:

```
1 {
2   "$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-
3   148.json#",
4   "capabilities": {
5     "baseline": {
6       "extensions": {
7         "VK_EXT_descriptor_indexing": 2,
8         "VK_EXT_host_query_reset": 1,
9         "VK_EXT_image_robustness": 1,
10        "VK_EXT_inline_uniform_block": 1,
11        "VK_EXT_memory_budget": 1,
12        "VK_EXT_robustness2": 1,
13        "VK_EXT_subgroup_size_control": 2,
14        "VK_EXT_texel_buffer_alignment": 1,
15        "VK_EXT_vertex_attribute_divisor": 3,
16        "VK_KHR_16bit_storage": 1,
17        "VK_KHR_8bit_storage": 1,
18        "VK_KHR_bind_memory2": 1,
19        "VK_KHR_create_renderpass2": 1,
20        "VK_KHR_dedicated_allocation": 3,
21        "VK_KHR_depth_stencil_resolve": 1,
22        "VK_KHR_descriptor_update_template": 1,
23        "VK_KHR_device_group": 4,
24        "VK_KHR_driver_properties": 1,
25        "VK_KHR_external_fence": 1,
26        "VK_KHR_external_memory": 1,
27        "VK_KHR_external_semaphore": 1,
28        "VK_KHR_get_memory_requirements2": 1,
29      }
30    }
31  }
```

✓ No errors found. JSON validates against the schema

We can replace the required Profile Schema from VP\_LUNARG\_desktop\_baseline\_2023

## Vulkan Layers Management

- ☐ Layers Fully Controlled by the Vulkan Applications
- ☒ Overriding Layers by the Vulkan Configurator
- ☐ Apply only to the Vulkan Applications List
- ☐ Continue Overriding Layers on Exit

Edit Applications...

## Vulkan Layers Configurations

- ☐ API dump
- ☐ Frame Capture
- ☒ Portability
- ☐ Synchronization
- ☐ Validation

New...

Edit...

Duplicate

Remove

## Vulkan Application Launcher

&gt; Application vkcube

☒ Clear log at launch

Clear

Vulkan Loader Messages:

none

Launch

## Vulkan Development Status:

- Layers override: "Portability" configuration
- VULKAN\_SDK environment variable: E:\VulkanSDK\1.3.236.0
- Vulkan Loader version: 1.3.224
- User-Defined Layers locations:
  - VK\_LAYER\_PATH variable: None
  - Per-configuration paths: None
  - VK\_ADD\_LAYER\_PATH variable: None
- `vk\_layer\_settings.txt` uses the default platform path:  
C:\Users\Piranha\AppData\Local\LunarG\vkconfig\override
- Available Layers:

## Portability Settings

## Vulkan Applications

## VK\_LAYER\_KHRONOS\_validation

User-Defined Settings

## &gt; Validation Areas

## Debug Action

## Log Message

## Log Filename

stdout

☐ Debug Output☐ Break

## Message Severity

☒ Info☒ Warning☒ Performance☒ Error

## Limit Duplicated Messages

Max Duplicated Messages

10

Mute Message VUIDs

## VK\_LAYER\_KHRONOS\_profiles

User-Defined Settings

## Profile Selection

\_LUNARG\_desktop\_portability\_2022.json

☐ Schema Validation

## Emulate VK\_KHR\_portability\_subset

☐ constantAlphaColorBlendFactors☐ events



## Vulkan Layers Management

☐ Layers Fully Controlled by the Vulkan Applications☒ Overriding Layers by the Vulkan Configurator☐ Apply only to the Vulkan Applications List☐ Continue Overriding Layers on Exit

Edit Applications...

## Vulkan Layers Configurations

☐ API dump☐ Frame Capture☒ Portability☐ Synchronization☐ Validation

New...

Edit...

Duplicate

Remove

## Vulkan Application Launcher

&gt; Application

vkcube

☒ Clear log at launch

Clear

Vulkan Loader Messages:

none

Launch

## Vulkan Development Status:

- Layers override: "Portability" configuration
- VULKAN\_SDK environment variable: E:\VulkanSDK\1.3.236.0
- Vulkan Loader version: 1.3.224
- User-Defined Layers locations:
  - VK\_LAYER\_PATH variable: None
  - Per-configuration paths: None
  - VK\_ADD\_LAYER\_PATH variable: None
- `vk\_layer\_settings.txt` uses the default platform path:  
C:\Users\Piranha\AppData\Local\LunarG\vkconfig\override
- Available Layers:

## Portability Settings

## Vulkan Applications

## VK\_LAYER\_KHRONOS\_validation

User-Defined Settings

## &gt; Validation Areas

## Debug Action

## ✓ Log Message

## Log Filename

stdout

☐ Debug Output☐ Break

## Message Severity

☒ Info☒ Warning☒ Performance☒ Error

## ✓ Limit Duplicated Messages

Max Duplicated Messages

10

Mute Message VUIDs

## VK\_LAYER\_KHRONOS\_profiles

User-Defined Settings

## Profile Selection

\_LUNARG\_desktop\_portability\_2022.json

☐ Schema Validation

## ✓ Emulate VK\_KHR\_portability\_subset

☐ constantAlphaColorBlendFactors☐ events

Vulkan Layers Management

Portability Settings

Select file

« VulkanSDK » 1.3.236.0 » share » vulkan » registry »

Search registry

Organize New folder

	Name	Date modified	Type	Size
	__pycache__	25/01/2023 11:34	File folder	
	VK_LUNARG_desktop_baseline_2023	25/01/2023 11:32	File folder	
	profiles-0.8-latest.json	13/12/2022 18:20	JSON File	358 KB
	validusage.json	13/12/2022 18:20	JSON File	5 978 KB
	VK_LUNARG_desktop_baseline_2023.json	25/01/2023 11:43	JSON File	102 KB

File name: VK\_LUNARG\_desktop\_baseline\_2023.json

\*.json

Open Cancel

- VK\_ADD\_LAYER\_PATH variable: None

- `vk\_layer\_settings.txt` uses the default platform path:  
C:\Users\Piranha\AppData\Local\LunarG\vkconfig\override

- Available Layers:

☒ Emulate VK\_KHR\_portability\_subset

☐ constantAlphaColorBlendFactors

☐ events

## Vulkan Layers Management

- ☐ Layers Fully Controlled by the Vulkan Applications
- ☒ Overriding Layers by the Vulkan Configurator
- ☐ Apply only to the Vulkan Applications List
- ☐ Continue Overriding Layers on Exit

Edit Applications...

## Vulkan Layers Configurations

- ☐ API dump
- ☐ Frame Capture
- ☒ Portability
- ☐ Synchronization
- ☐ Validation

New...

Edit...

Duplicate

Remove

## Vulkan Application Launcher

&gt; Application vkcube

☒ Clear log at launch

Clear

Vulkan Loader Messages: none

Launch

## Vulkan Development Status:

- Layers override: "Portability" configuration
- VULKAN\_SDK environment variable: E:\VulkanSDK\1.3.236.0
- Vulkan Loader version: 1.3.224
- User-Defined Layers locations:
  - VK\_LAYER\_PATH variable: None
  - Per-configuration paths: None
  - VK\_ADD\_LAYER\_PATH variable: None
- `vk\_layer\_settings.txt` uses the default platform path:  
C:\Users\Piranha\AppData\Local\LunarG\vkconfig\override
- Available Layers:

## Portability Settings

## Vulkan Applications

## VK\_LAYER\_KHRONOS\_validation

User-Defined Settings

## &gt; Validation Areas

## Debug Action

## Log Message

## Log Filename

stdout

☐ Debug Output☐ Break

## Message Severity

☒ Info☒ Warning☒ Performance☒ Error

## Limit Duplicated Messages

Max Duplicated Messages

10

Mute Message VUIDs

## VK\_LAYER\_KHRONOS\_profiles

User-Defined Settings

## Profile Selection

K\_LUNARG\_desktop\_baseline\_2023.json

☐ Schema Validation

## Emulate VK\_KHR\_portability\_subset

☐ constantAlphaColorBlendFactors☐ events

12

F

Home

Share

View

←

→

↑

Source (E:)

>

VulkanSDK

>

1.3.236.0

>

share

>

vulkan

>

registry

Search registry

1.3.224.1 - dev

1.3.231.1

1.3.235.0 - tmp

1.3.236.0

Bin

Config

Demos

Helpers

Include

installerResources

Lib

Licenses

share

vulkan

registry

\_\_pycache\_\_

VK\_LUNARG\_desktop\_baseline\_

Source

Templates

Name	Date modified	Type	Size
__pycache__	30/01/2023 17:10	File folder	
VK_LUNARG_desktop_baseline_2023	30/01/2023 17:02	File folder	
gen_profiles_file.py	13/12/2022 18:20	JetBrains PyCharm ...	45 KB
gen_profiles_solution.py	13/12/2022 18:20	JetBrains PyCharm ...	215 KB
profiles-0.8-latest.json	13/12/2022 18:20	JSON File	358 KB
validusage.json	13/12/2022 18:20	JSON File	5 978 KB
video.xml	13/12/2022 18:20	XML Document	116 KB
vk.xml	13/12/2022 18:20	XML Document	2 085 KB
VK_LUNARG_desktop_baseline_2023.json	30/01/2023 17:18	JSON File	102 KB

9 items

|

1 item selected

214 KB

|

To regenerate the Vulkan Profiles API library  
and include our new Vulkan Profile

```
Piranha@Piranha MINGW64 /e/vulkanSDK/1.3.236.0/share/vulkan/registry
$ python gen_profiles_solution.py --registry vk.xml --input ./profiles --output-library-inc ./ --output-library-src ./
Loading registry file: 'vk.xml'
Loading profile file: 'VP_LUNARG_desktop_baseline_2023.json'
Registering profile 'VP_LUNARG_merged_2023_01_30_17_18'
Generating 'E:\VulkanSDK\1.3.236.0\share\vulkan\registry\vulkan_profiles.h'...
Generating 'E:\VulkanSDK\1.3.236.0\share\vulkan\registry\vulkan_profiles.cpp'...
Generating 'E:\VulkanSDK\1.3.236.0\share\vulkan\registry\vulkan_profiles.hpp'...

Piranha@Piranha MINGW64 /e/vulkanSDK/1.3.236.0/share/vulkan/registry
$ |
```



File Explorer window showing the directory structure of the Vulkan SDK 1.3.236.0 share folder. The path is E:\VulkanSDK\1.3.236.0\share\vulkan\registry.

The left sidebar shows the directory tree, with the 'registry' folder selected under 'vulkan'.

The main pane displays a table of files and folders:

Name	Date modified	Type	Size
__pycache__	30/01/2023 17:10	File folder	
profiles	30/01/2023 17:53	File folder	
VK_LUNARG_desktop_baseline_2023	30/01/2023 17:02	File folder	
gen_profiles_file.py	13/12/2022 18:20	JetBrains PyCharm ...	45 KB
gen_profiles_solution.py	13/12/2022 18:20	JetBrains PyCharm ...	215 KB
profiles-0.8-latest.json	13/12/2022 18:20	JSON File	358 KB
validusage.json	13/12/2022 18:20	JSON File	5 978 KB
video.xml	13/12/2022 18:20	XML Document	116 KB
vk.xml	13/12/2022 18:20	XML Document	2 085 KB
vulkan_profiles.cpp	30/01/2023 17:54	C++ Source file	252 KB
vulkan_profiles.h	30/01/2023 17:54	H File	10 KB
vulkan_profiles.hpp	30/01/2023 17:54	C++ Header file	261 KB

The files **vulkan\_profiles.cpp**, **vulkan\_profiles.h**, and **vulkan\_profiles.hpp** are highlighted with a green box.

The text "The Vulkan API library updated supporting our profile!" is overlaid in green.

## Checking the support of our new profile with the Profile API library

```
const VpProfileProperties profile{
    VP_LUNARG_DESKTOP_BASELINE_2023_NAME,
    VP_LUNARG_DESKTOP_BASELINE_2023_SPEC_VERSION};

VkBool32 supported = VK_FALSE;
vpGetPhysicalDeviceProfileSupport(
    instance, physicalDevice, &profile, &supported);
```

## Creating a VkDevice using our new profile with the Profile API library

```
const VpProfileProperties profile = {  
    VP_LUNARG_DESKTOP_BASELINE_2023_NAME,  
    VP_LUNARG_DESKTOP_BASELINE_2023_SPEC_VERSION};
```

```
VkDeviceCreateInfo info = {};
```

```
...
```

```
VpDeviceCreateInfo profileInfo = {};  
profileInfo.pCreateInfo = &info;  
profileInfo.pProfile = &profile;
```

```
VkDevice device = VK_NULL_HANDLE;  
VkResult res = vpCreateDevice(physicalDevice, &profileInfo, nullptr, &device);
```

# Questions?



[christophe@lunarg.com](mailto:christophe@lunarg.com)

<https://github.com/KhronosGroup/Vulkan-Profiles/issues>



Help Us Improve the  
Vulkan SDK and Ecosystem

Share Your Feedback

**Take the LunarG annual developer's survey**

- Survey results are tabulated
- Shared with the Vulkan Working Group
- Actions are assigned
- Results are reported

**Survey closes February 27, 2023**



<https://www.surveymonkey.com/r/PVM92RH>



LUNAR)G<sup>®</sup>

An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.

View source code

Select schema:

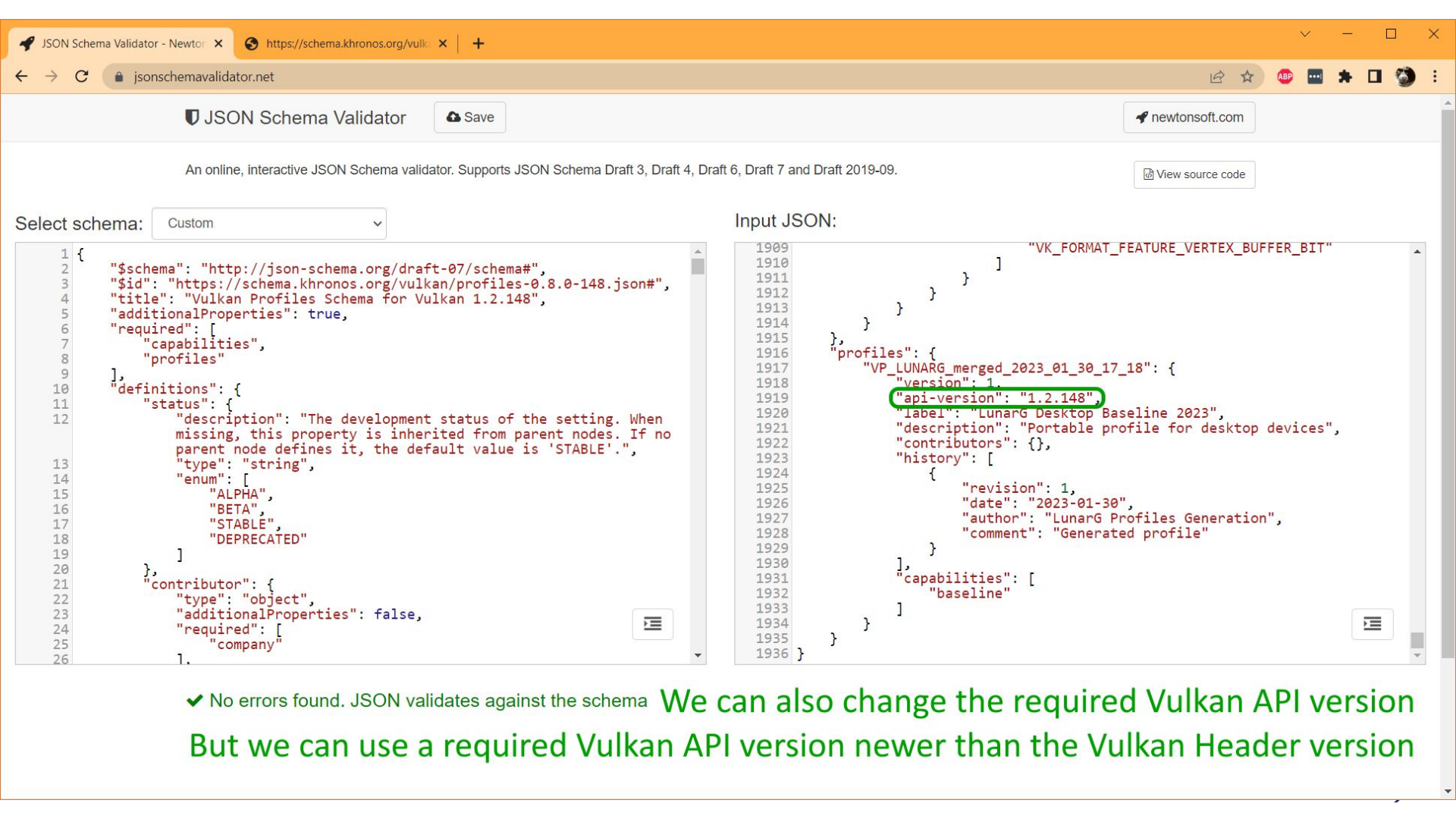
Custom

```
1 {
2   "$schema": "http://json-schema.org/draft-07/schema#",
3   "$id": "https://schema.khronos.org/vulkan/profiles-0.8.0-148.json#",
4   "title": "Vulkan Profiles Schema for Vulkan 1.2.148",
5   "additionalProperties": true,
6   "required": [
7     "capabilities",
8     "profiles"
9   ],
10  "definitions": {
11    "status": {
12      "description": "The development status of the setting. When
13      missing, this property is inherited from parent nodes. If no
14      parent node defines it, the default value is 'STABLE'.",
15      "type": "string",
16      "enum": [
17        "ALPHA",
18        "BETA",
19        "STABLE",
20        "DEPRECATED"
21      ]
22    },
23    "contributor": {
24      "type": "object",
25      "additionalProperties": false,
26      "required": [
27        "company"
28      ]
29    }
30  },
31  "profiles": [
32    {
33      "label": "LunarG Desktop Baseline 2023",
34      "description": "Portable profile for desktop devices",
35      "contributors": {},
36      "history": [
37        {
38          "revision": 1,
39          "date": "2023-01-30",
40          "author": "LunarG Profiles Generation",
41          "comment": "Generated profile"
42        }
43      ],
44      "capabilities": [
45        "baseline"
46      ]
47    }
48  ]
49 }
```

Input JSON:

```
1909 "VK_FORMAT_FEATURE_VERTEX_BUFFER_BIT"
1910 ]
1911 }
1912 }
1913 }
1914 }
1915 },
1916 "profiles": {
1917   "VP_LUNARG_merged_2023_01_30_17_18": {
1918     "version": 1,
1919     "api-version": "1.2.170",
1920     "label": "LunarG Desktop Baseline 2023",
1921     "description": "Portable profile for desktop devices",
1922     "contributors": {},
1923     "history": [
1924       {
1925         "revision": 1,
1926         "date": "2023-01-30",
1927         "author": "LunarG Profiles Generation",
1928         "comment": "Generated profile"
1929       }
1930     ],
1931     "capabilities": [
1932       "baseline"
1933     ]
1934   }
1935 }
1936 }
```

✓ No errors found. JSON validates against the schema



✓ No errors found. JSON validates against the schema We can also change the required Vulkan API version  
But we can use a required Vulkan API version newer than the Vulkan Header version