Creating 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/

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Audience questions…

Please, raise your hand if

- You shipped a Vulkan application?
- You have used some of the Vulkan SDK Profiles tools?

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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

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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 capability requirements
- Makes it easier to create portable Vulkan applications and tools

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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 Vulkan support actually available on a platform.
  - Eg: Android Baseline 2021 and 2022, LunarG Portability 2022 profiles.
- Device profiles:
  - To express the Vulkan support of a single Vulkan driver for a Vulkan device.
  - Eg: GPUinfo.org reports and vulkaninfo.
- Application 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.

The Vulkan SDK Profiles Tools:

- Allow exchanging Vulkan Profiles programmatically
  - Using the Vulkan Profiles JSON schema
- Allow creating Vulkan Profiles
  - Using tools export and combine profiles
- Allow comparing Vulkan Profiles against each other
  - Using a Vulkan Profiles markdown file
- Allow emulating/clamping Vulkan developer system to Vulkan Profile capabilities
  - Using the Vulkan Profiles layer
- Allow simplifying Vulkan application code to check and enable Vulkan Profiles
  - Using the Vulkan Profiles API library

The Vulkan SDK Profiles Tools are fully generated from vk.xml and a list of profiles

Creating a Vulkan Profile

Using the new profiles combination script

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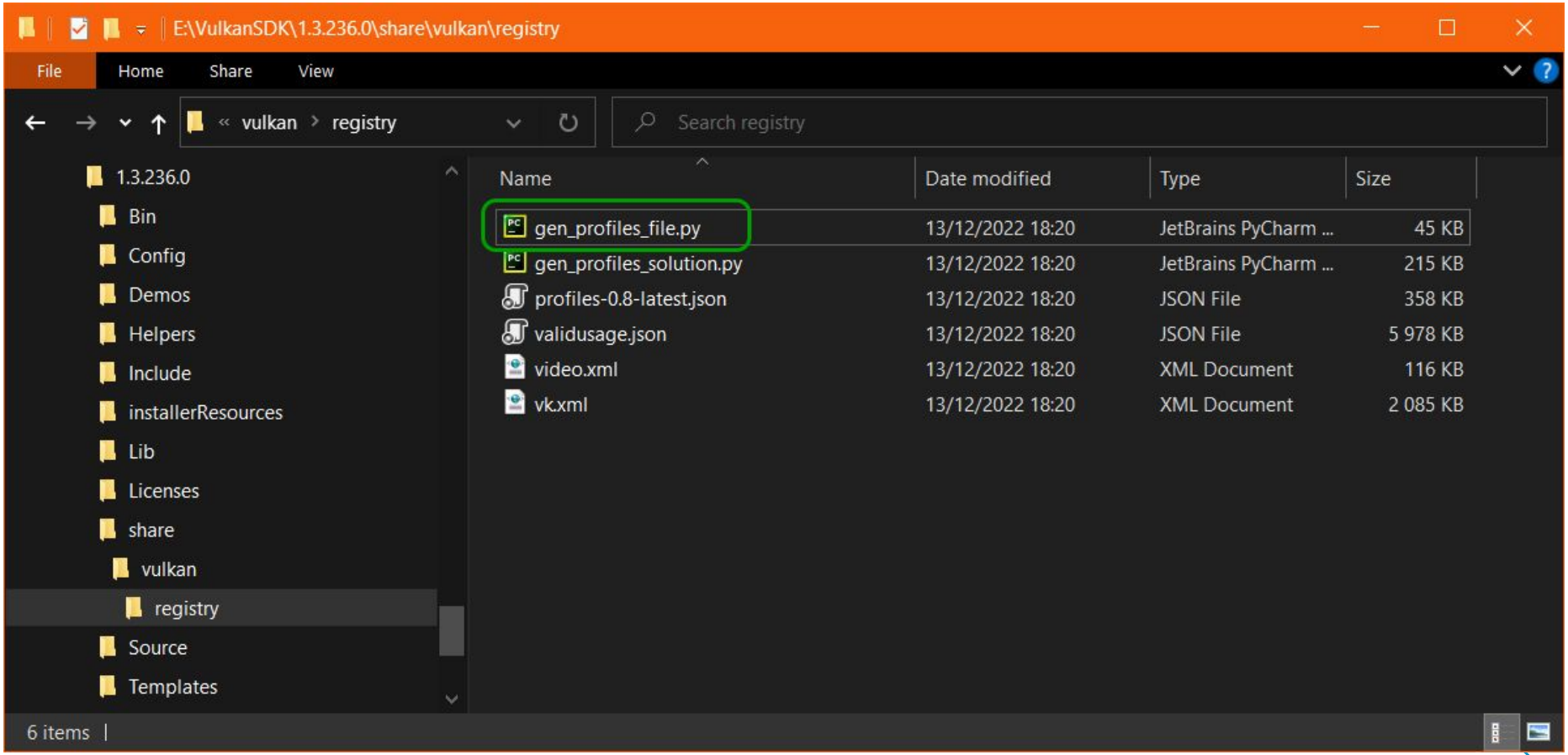
A scenario for this tutorial:

- 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
- Our Vulkan application previously required LunarG Desktop Baseline 2022 profile, a Vulkan 1.1-based profile
- We want to create a new profile called “LunarG Desktop Baseline 2023” which requires Vulkan 1.2


E:\VulkanSDK\1.3.236.0\share\vulkan\registry
File
Home
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registry
Search registry
1.3.236.0
Bin
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Demos
Helpers
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gen_profiles_file.py
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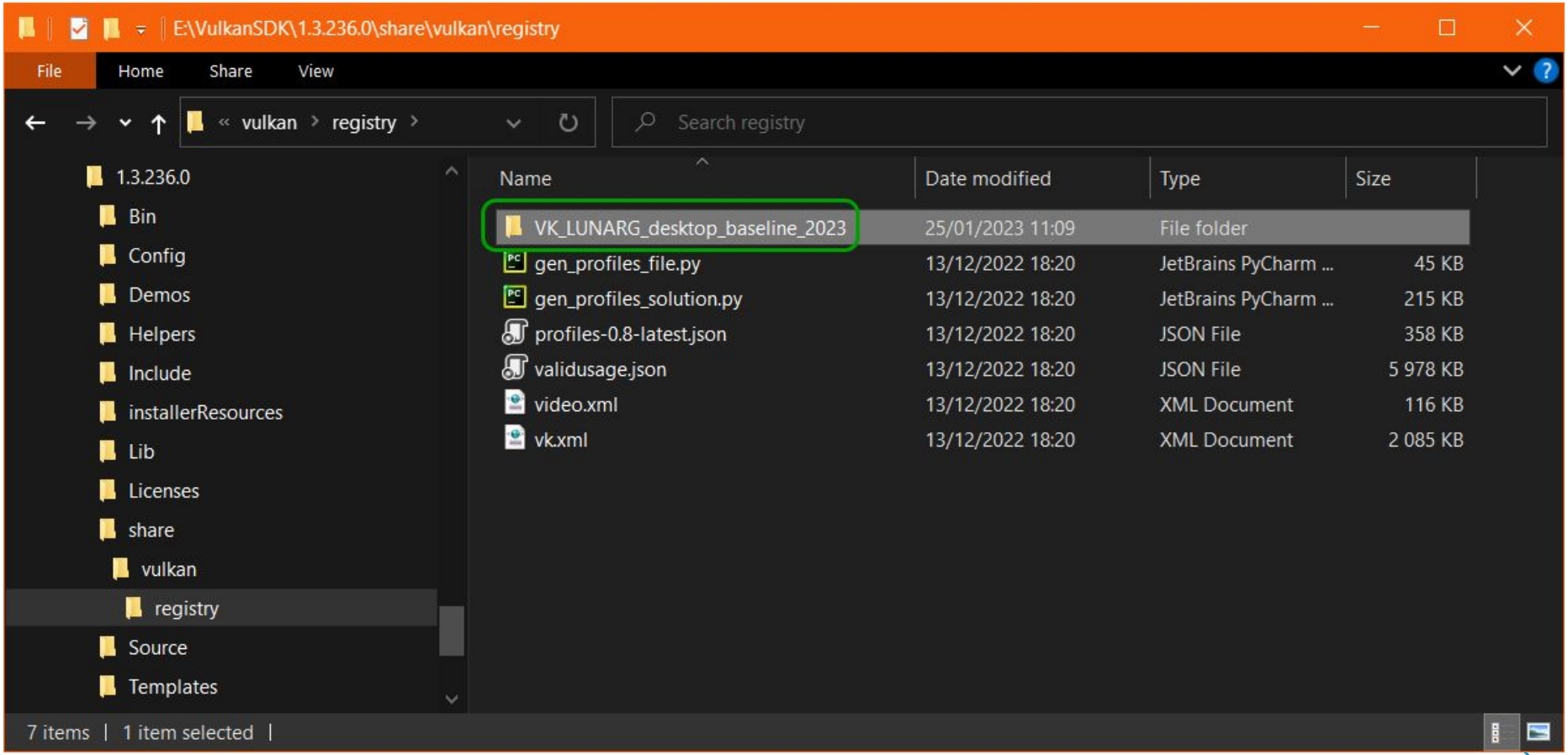
E:\VulkanSDK\1.3.236.0\share\vulkan\registry
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Home
Share
View
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1.3.236.0
Bin
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Demos
Helpers
Include
installerResources
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Licenses
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Templates
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Date modified
Type
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13/12/2022 18:20
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validusage.json
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XML Document
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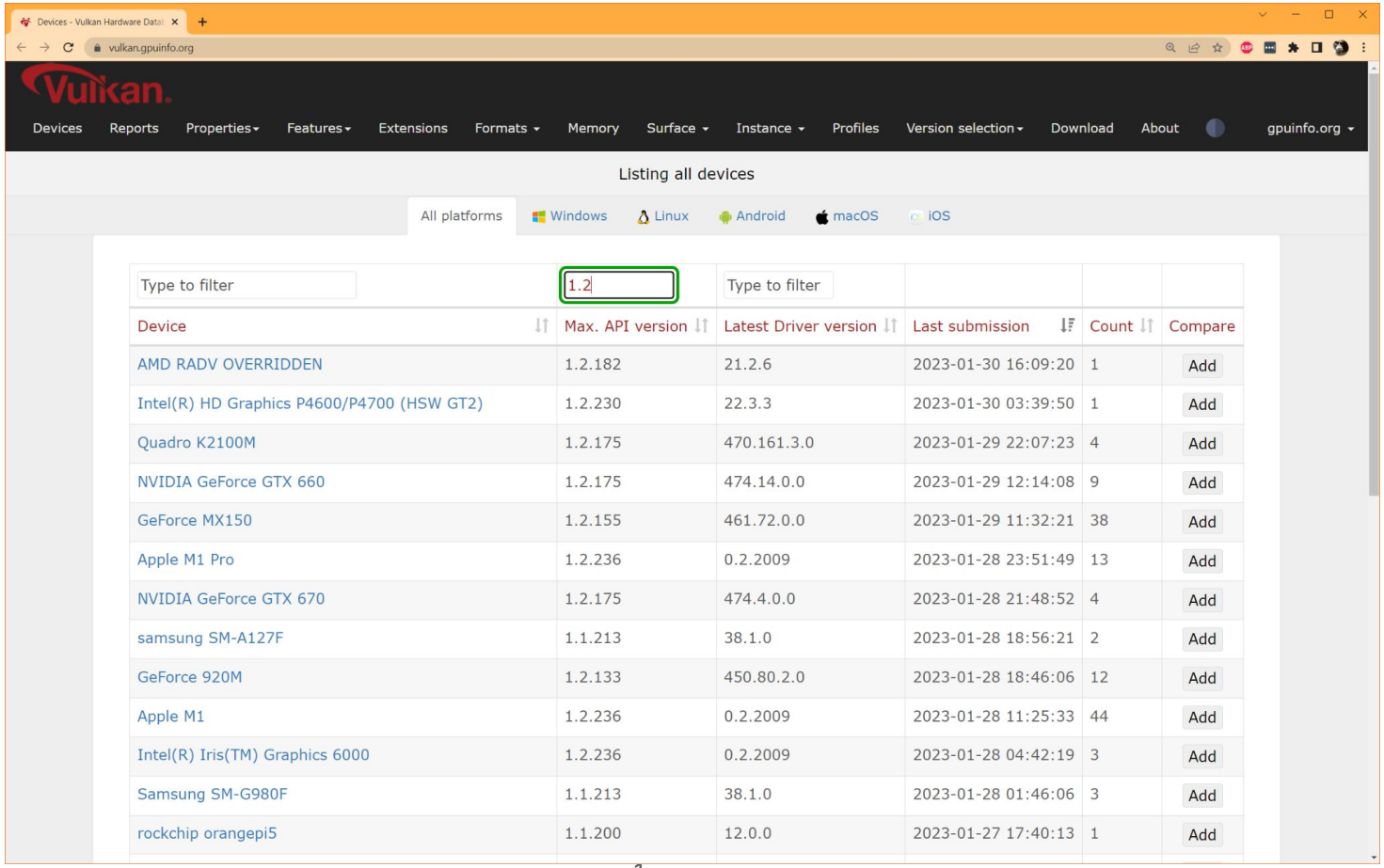
Devices - Vulkan Hardware Datal
vulkan.gpuinfo.org
Vulkan
Devices
Reports
Properties
Features
Extensions
Formats
Memory
Surface
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Profiles
Version selection
Download
About
gpuinfo.org
Listing all devices
All platforms
Windows
Linux
Android
macOS
iOS
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 Add
Intel(R) HD Graphics P4600/P4700 (HSW GT2) 1.2.230 22.3.3 2023-01-30 03:39:50 1 Add
Quadro K2100M 1.2.175 470.161.3.0 2023-01-29 22:07:23 4 Add
NVIDIA GeForce GTX 660 1.2.175 474.14.0.0 2023-01-29 12:14:08 9 Add
GeForce MX150 1.2.155 461.72.0.0 2023-01-29 11:32:21 38 Add
Apple M1 Pro 1.2.236 0.2.2009 2023-01-28 23:51:49 13 Add
NVIDIA GeForce GTX 670 1.2.175 474.4.0.0 2023-01-28 21:48:52 4 Add
samsung SM-A127F 1.1.213 38.1.0 2023-01-28 18:56:21 2 Add
GeForce 920M 1.2.133 450.80.2.0 2023-01-28 18:46:06 12 Add
Apple M1 1.2.236 0.2.2009 2023-01-28 11:25:33 44 Add
Intel(R) Iris(TM) Graphics 6000 1.2.236 0.2.2009 2023-01-28 04:42:19 3 Add
Samsung SM-G980F 1.1.213 38.1.0 2023-01-28 01:46:06 3 Add
rockchip orangepi5 1.1.200 12.0.0 2023-01-27 17:40:13 1 Add

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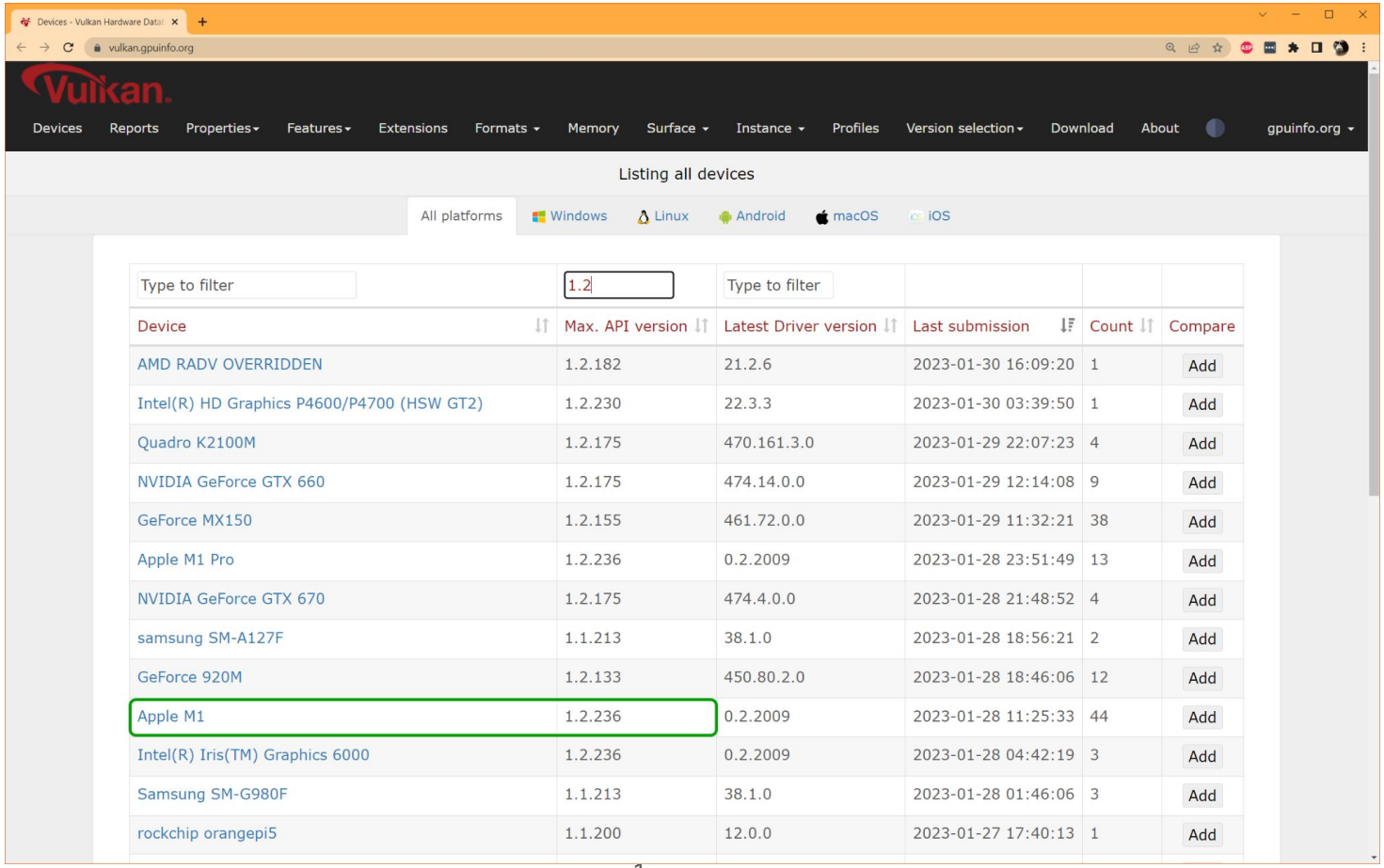
Devices - Vulkan Hardware Datal
vulkan.gpuinfo.org
Vulkan
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Features
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Version selection
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All platforms
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1.2
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 Add
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Samsung SM-G980F 1.1.213 38.1.0 2023-01-28 01:46:06 3 Add
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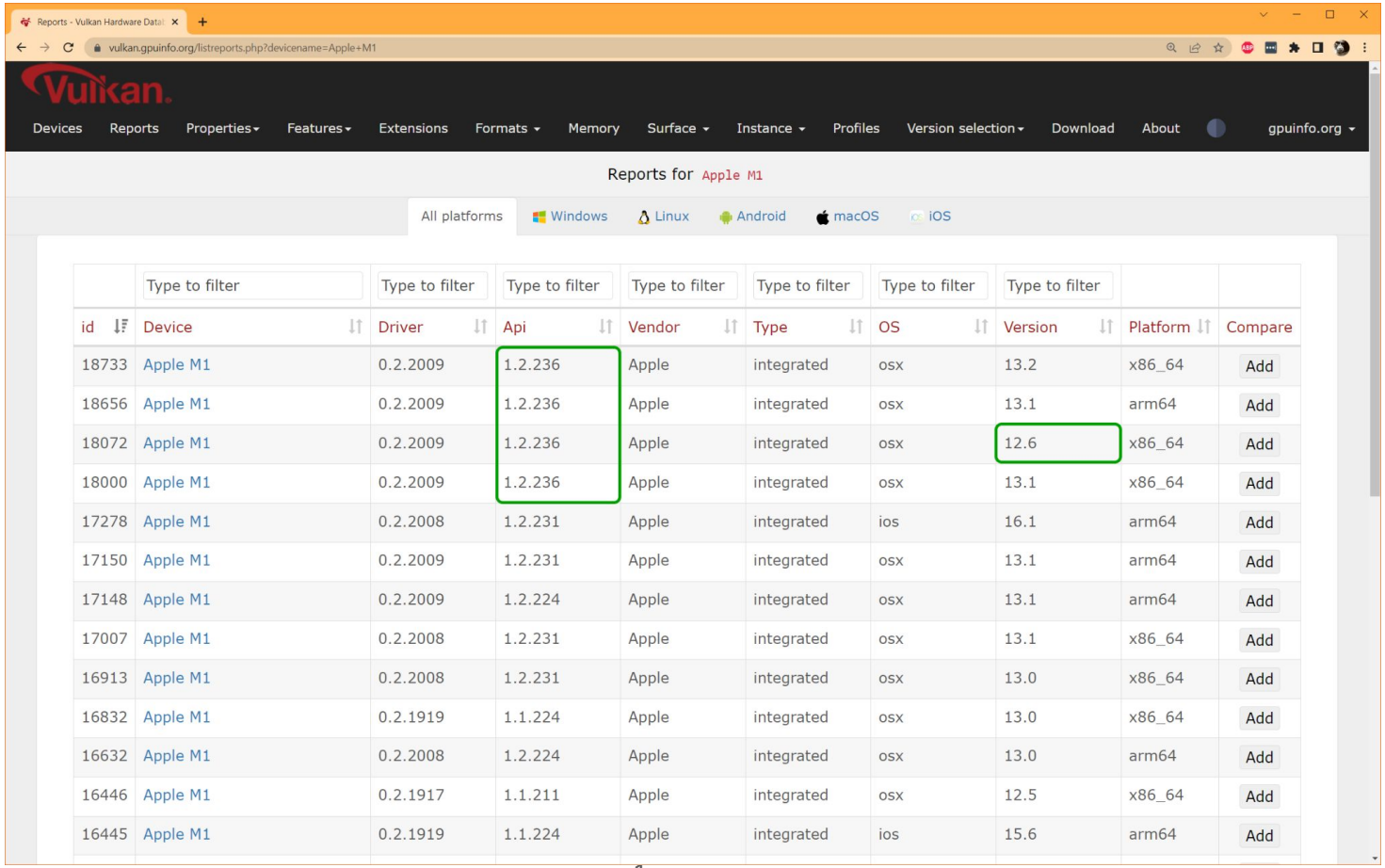

Reports - Vulkan Hardware Data

vulkan.gpuinfo.org/listreports.php?devicename=Apple+M1

Vulkan

Devices | Reports | Properties | Features | Extensions | Formats | Memory | Surface | Instance | Profiles | Version selection | Download | About | gpuinfo.org

Reports for Apple M1

All platforms | Windows | Linux | Android | macOS | iOS

	Type to filter	Type to filter	Type to filter	Type to filter	Type to filter	Type to filter	Type to filter		
id	Device	Driver	Api	Vendor	Type	OS	Version	Platform	Compare
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18656	Apple M1	0.2.2009	1.2.236	Apple	integrated	osx	13.1	arm64	Add
18072	Apple M1	0.2.2009	1.2.236	Apple	integrated	osx	12.6	x86_64	Add
18000	Apple M1	0.2.2009	1.2.236	Apple	integrated	osx	13.1	x86_64	Add
17278	Apple M1	0.2.2008	1.2.231	Apple	integrated	ios	16.1	arm64	Add
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17148	Apple M1	0.2.2009	1.2.224	Apple	integrated	osx	13.1	arm64	Add
17007	Apple M1	0.2.2008	1.2.231	Apple	integrated	osx	13.1	x86_64	Add
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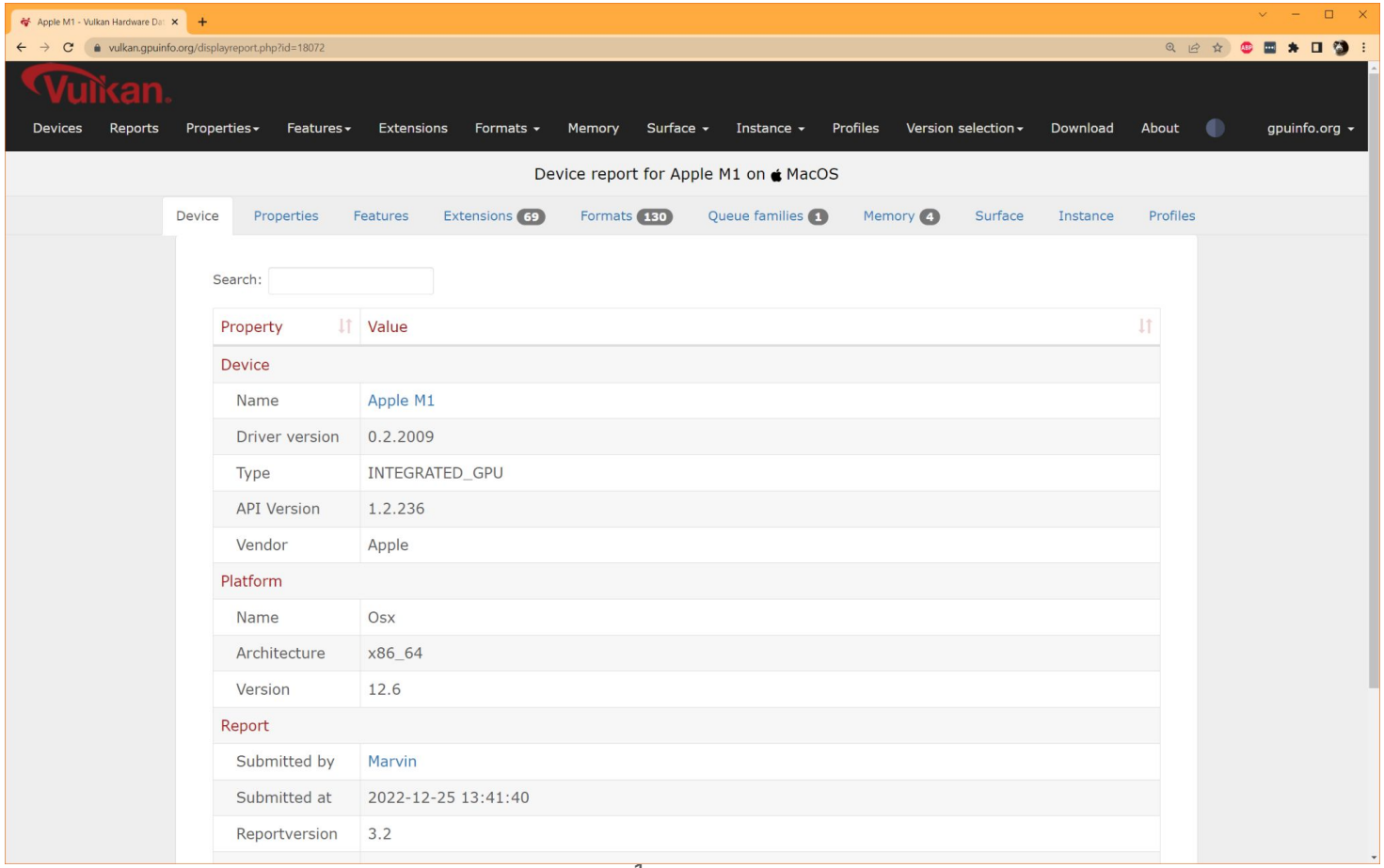
Apple M1 - Vulkan Hardware Dat
vulkan.gpuinfo.org/displayreport.php?id=18072
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Device report for Apple M1 on MacOS
Device
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Extensions 69
Formats 130
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Property
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Driver version
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Vendor
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Version
12.6
Report
Submitted by
Marvin
Submitted at
2022-12-25 13:41:40
Reportversion
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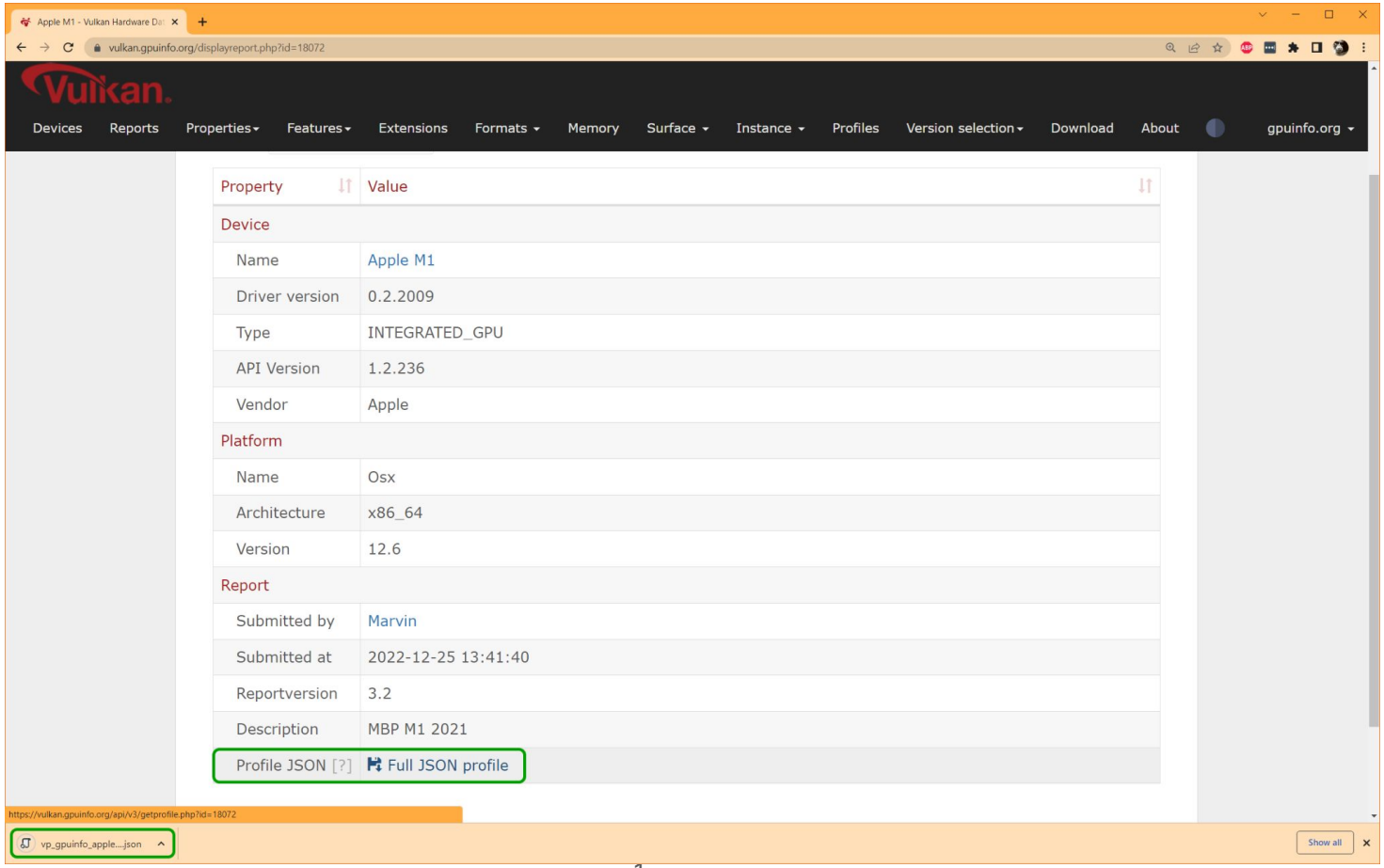
Apple M1 - Vulkan Hardware Da
vulkan.gpuinfo.org/displayreport.php?id=18072
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About
gpuinfo.org
Property
Value
Device
Name
Apple M1
Driver version
0.2.2009
Type
INTEGRATED_GPU
API Version
1.2.236
Vendor
Apple
Platform
Name
Osx
Architecture
x86_64
Version
12.6
Report
Submitted by
Marvin
Submitted at
2022-12-25 13:41:40
Reportversion
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Description
MBP M1 2021
Profile JSON [?]
Full JSON profile
https://vulkan.gpuinfo.org/api/v3/getprofile.php?id=18072
vp_gpuinfo_apple....json
Show all

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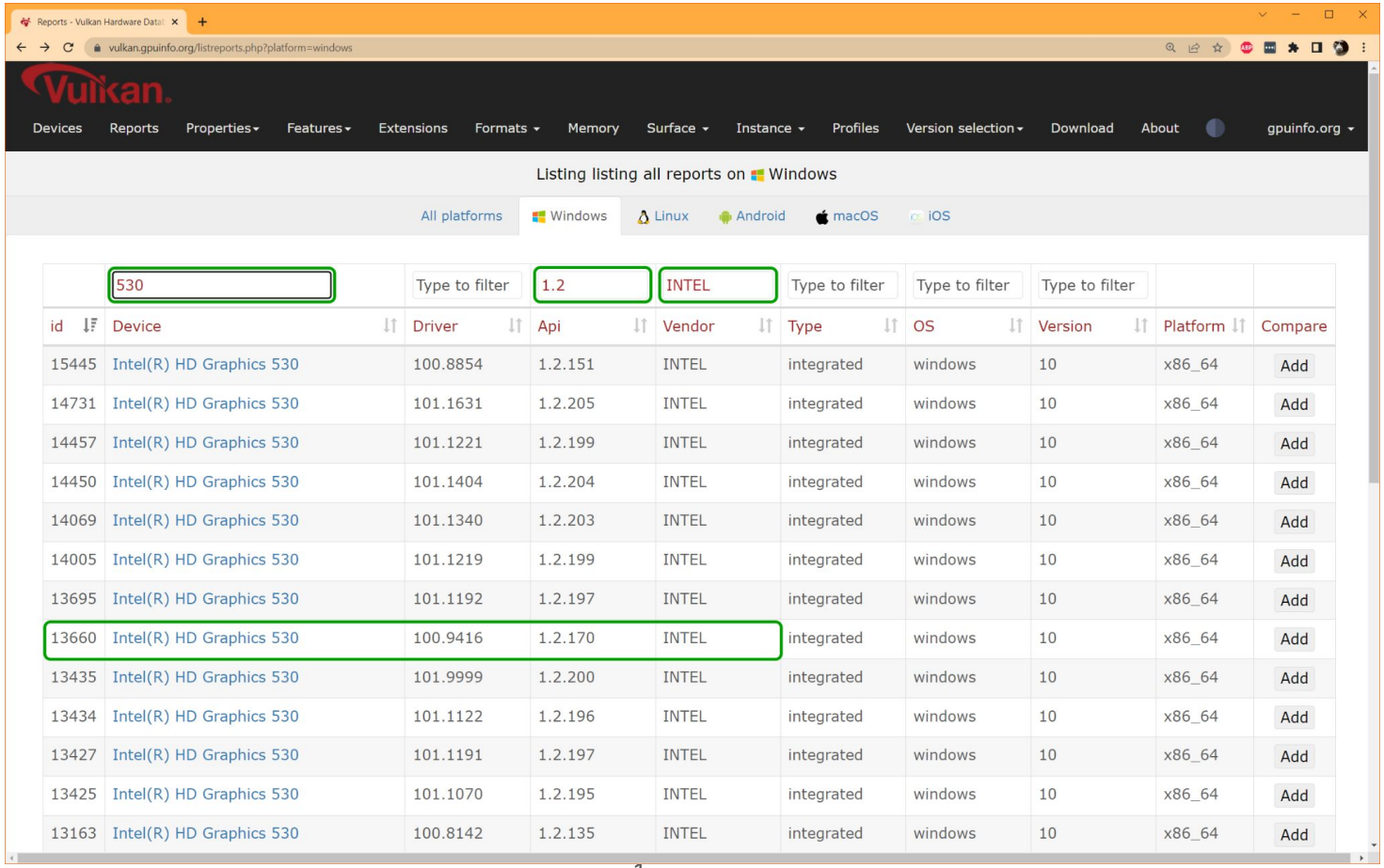

Reports - Vulkan Hardware Data

vulkan.gpuinfo.org/listreports.php?platform=windows

Vulkan

Devices | Reports | Properties | Features | Extensions | Formats | Memory | Surface | Instance | Profiles | Version selection | Download | About | gpuinfo.org

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

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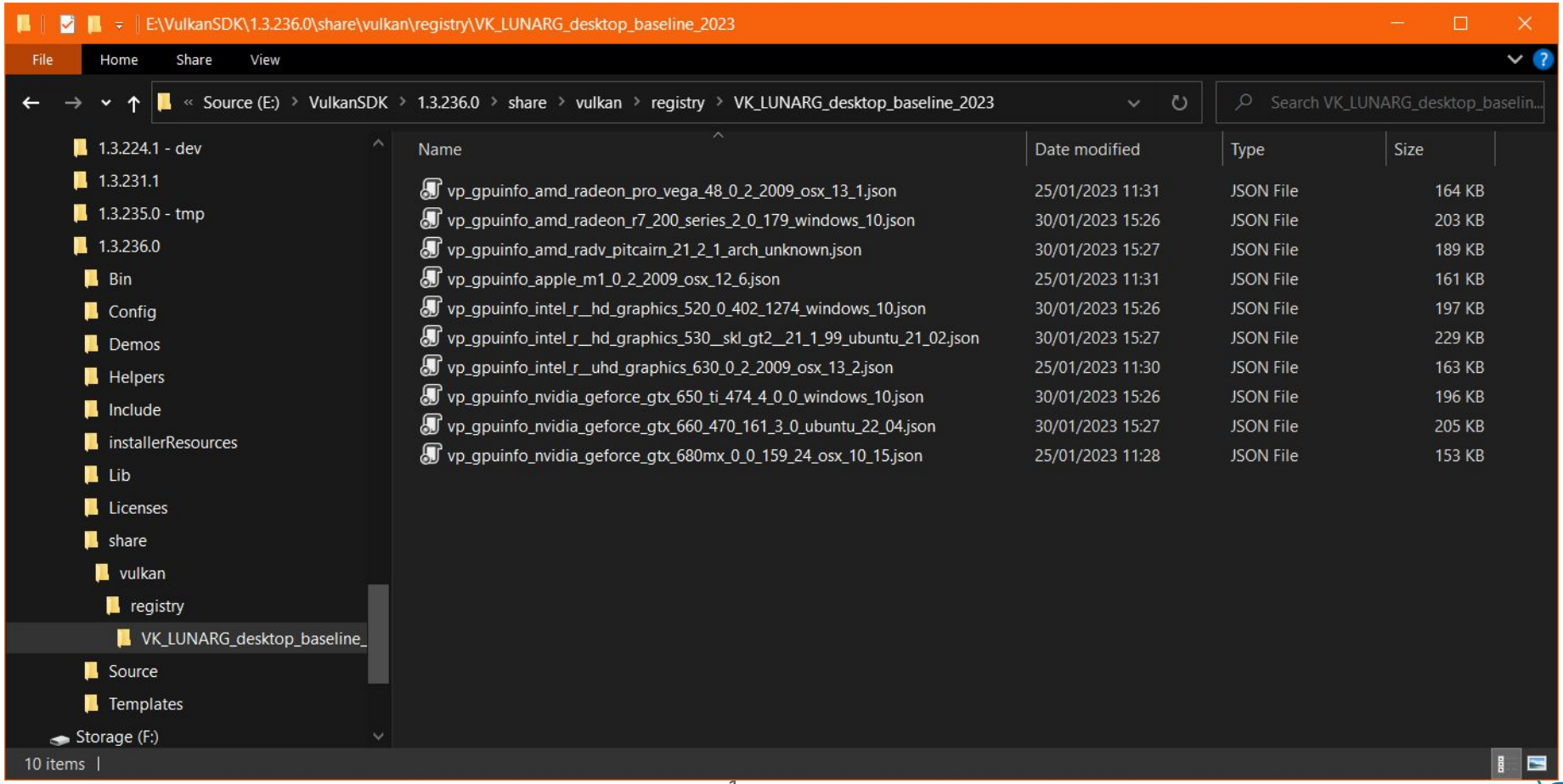
E:\VulkanSDK\1.3.236.0\share\vulkan\registry\VK_LUNARG_desktop_baseline_2023
File
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Source (E:) › VulkanSDK › 1.3.236.0 › share › vulkan › registry › VK_LUNARG_desktop_baseline_2023
Search VK_LUNARG_desktop_baselin...
1.3.224.1 - dev
1.3.231.1
1.3.235.0 - tmp
1.3.236.0
Bin
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Templates
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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
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vp_gpuinfo_nvidia_geforce_gtx_650_ti_474_4_0_0_windows_10.json 30/01/2023 15:26 JSON File 196 KB
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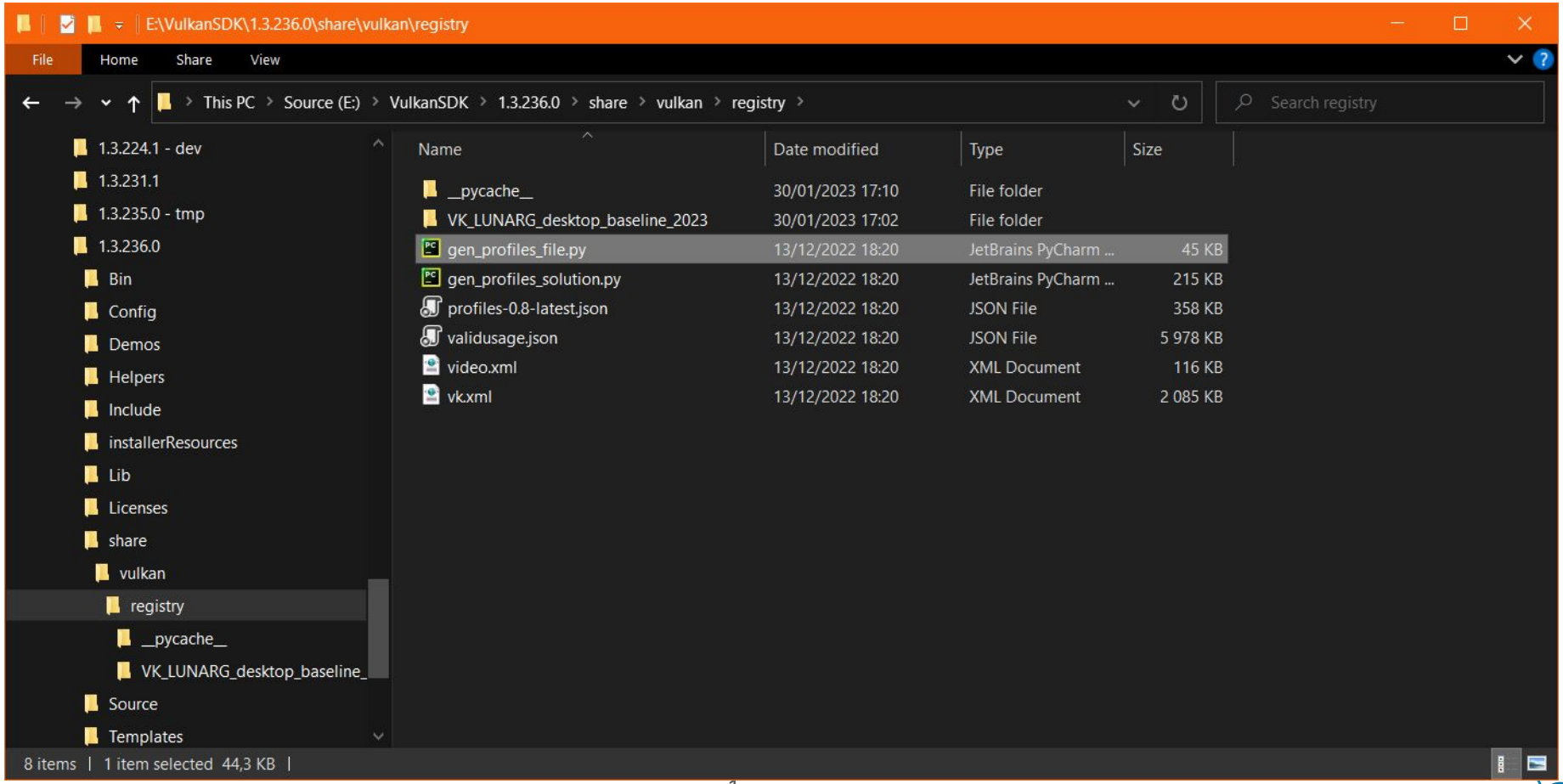
10 items


E:\VulkanSDK\1.3.236.0\share\vulkan\registry
File
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VulkanSDK
1.3.236.0
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Search registry
1.3.224.1 - dev
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VK_LUNARG_desktop_baseline_
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Templates
Name
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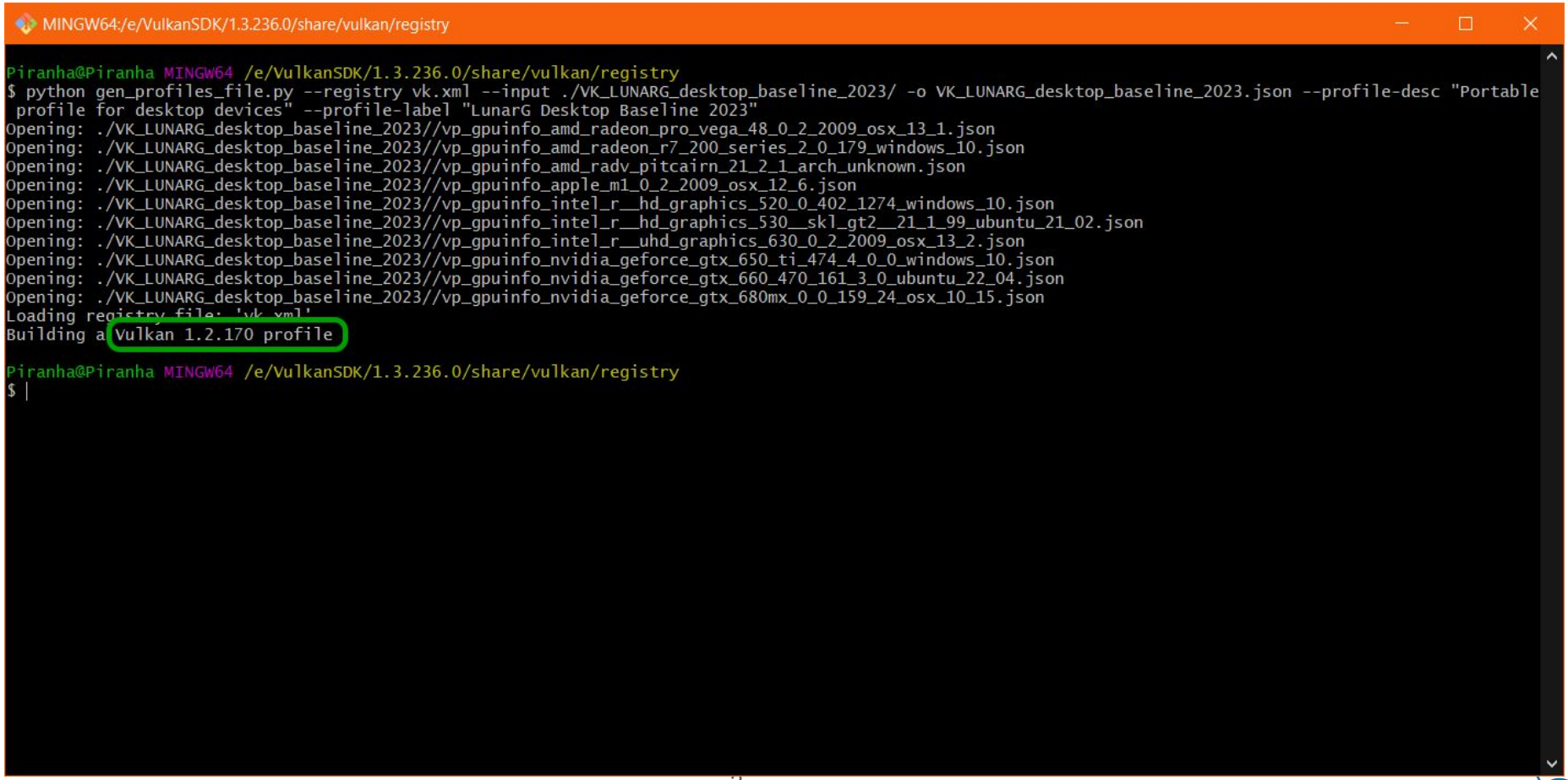
Type
Size
__pycache__ 30/01/2023 17:10 File folder
VK_LUNARG_desktop_baseline_2023 30/01/2023 17:02 File folder
gen_profiles_file.py 13/12/2022 18:20 JetBrains PyCharm ... 45 KB
gen_profiles_solution.py 13/12/2022 18:20 JetBrains PyCharm ... 215 KB
profiles-0.8-latest.json 13/12/2022 18:20 JSON File 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
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
$

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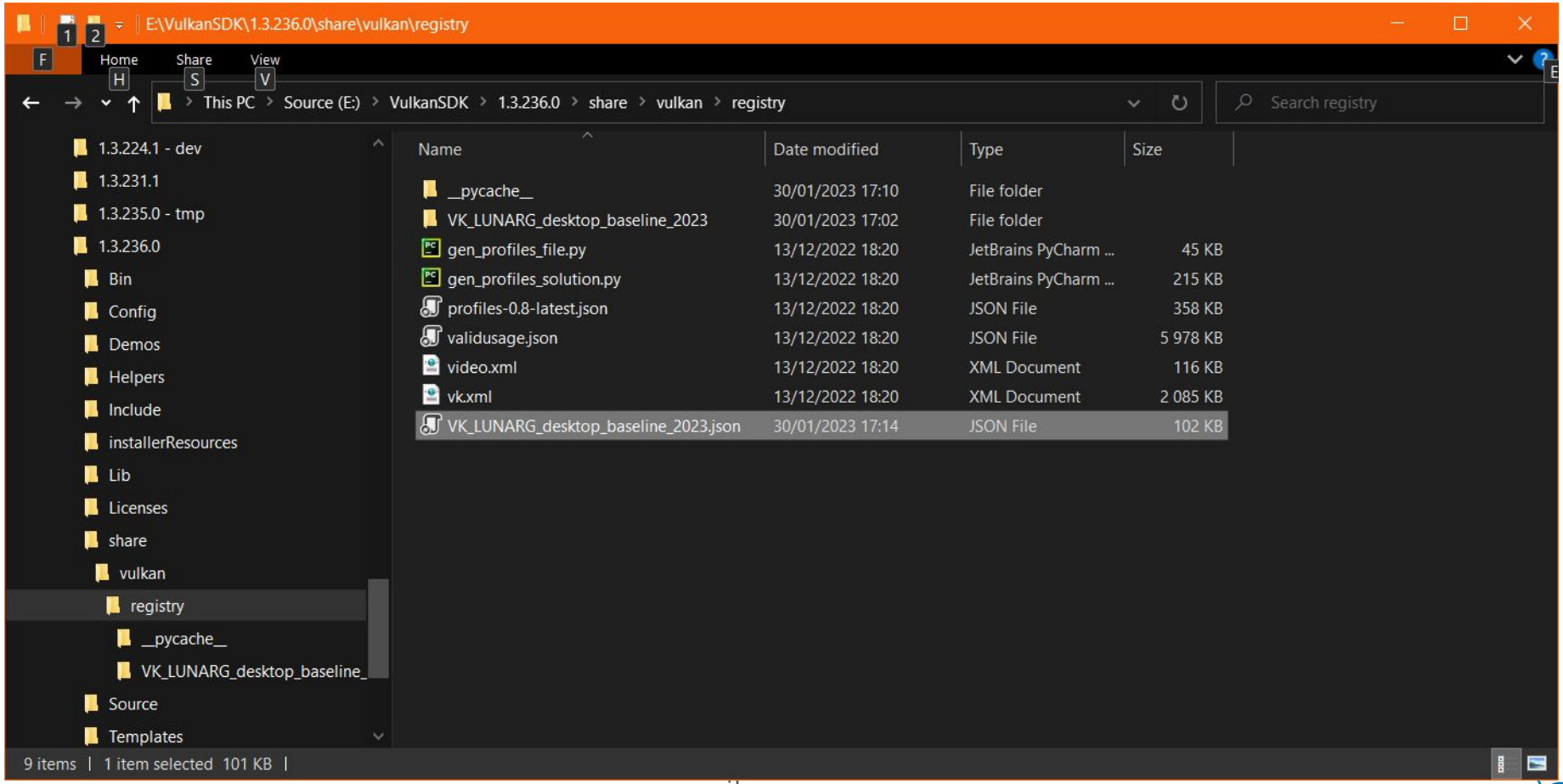
E:\VulkanSDK\1.3.236.0\share\vulkan\registry
Home
Share
View
This PC
Source (E:)
VulkanSDK
1.3.236.0
share
vulkan
registry
Search registry
1.3.224.1 - dev
1.3.231.1
1.3.235.0 - tmp
1.3.236.0
Bin
Config
Demos
Helpers
Include
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Lib
Licenses
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__pycache__
VK_LUNARG_desktop_baseline_
Source
Templates
Name
Date modified
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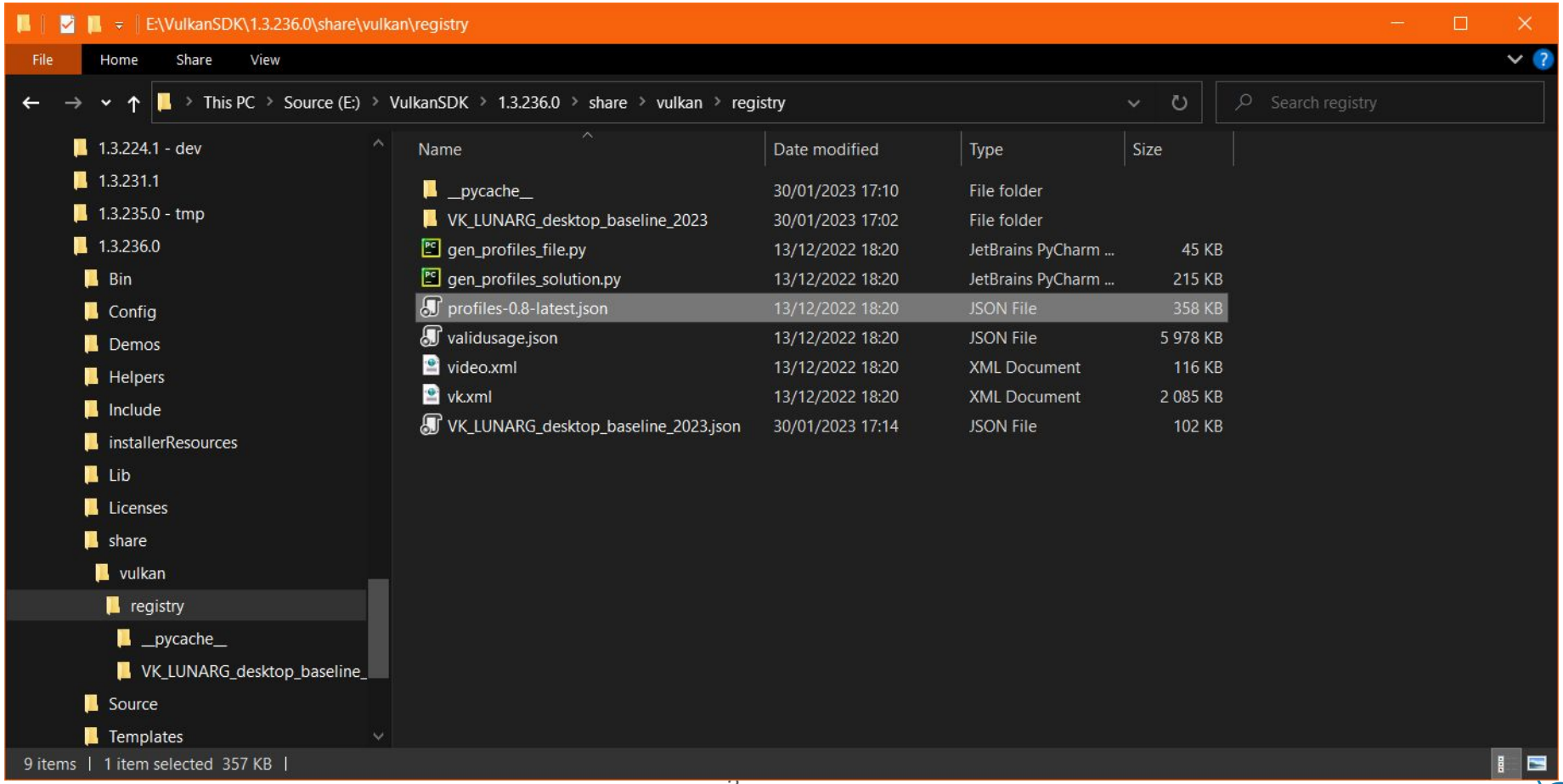
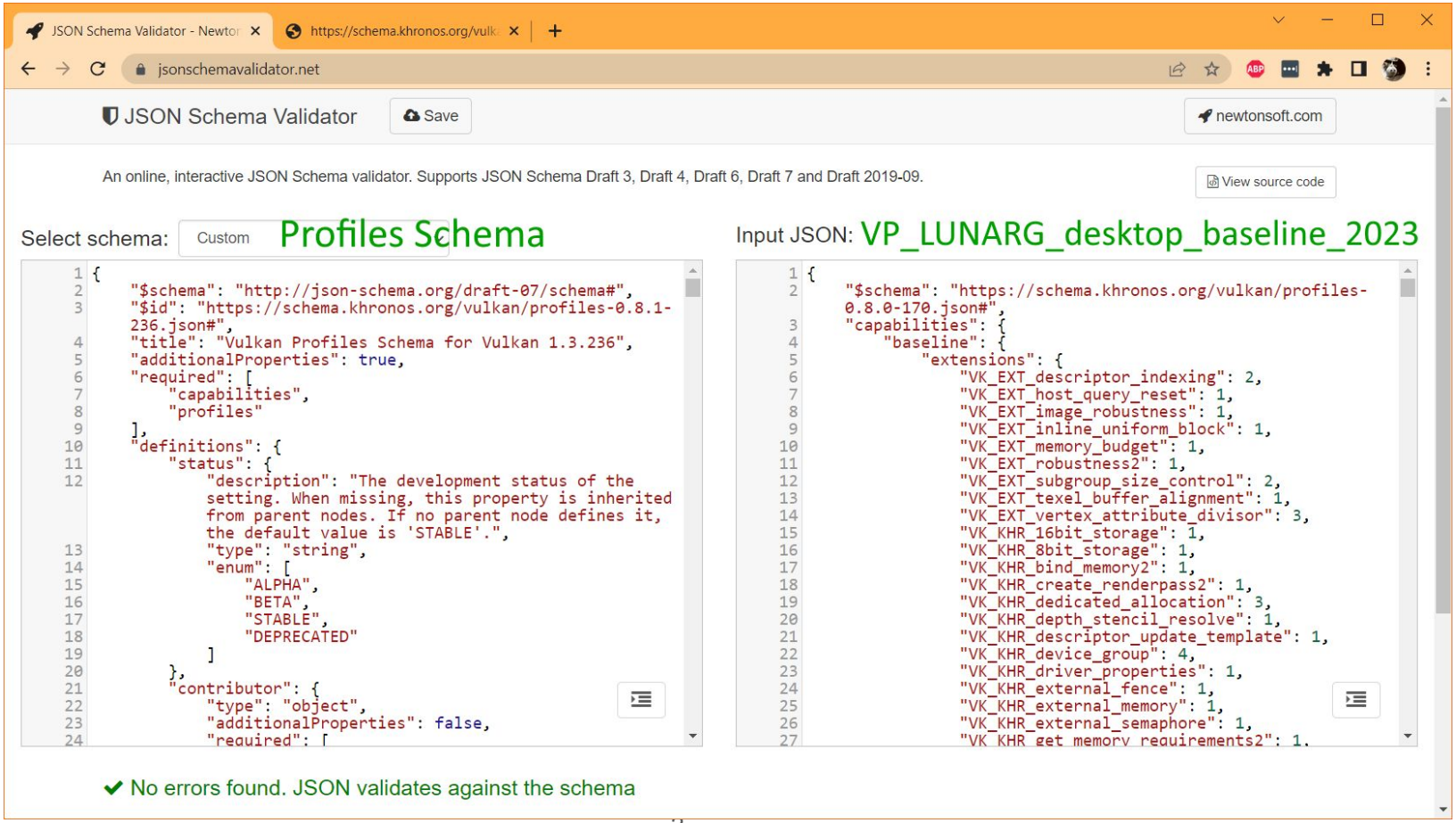
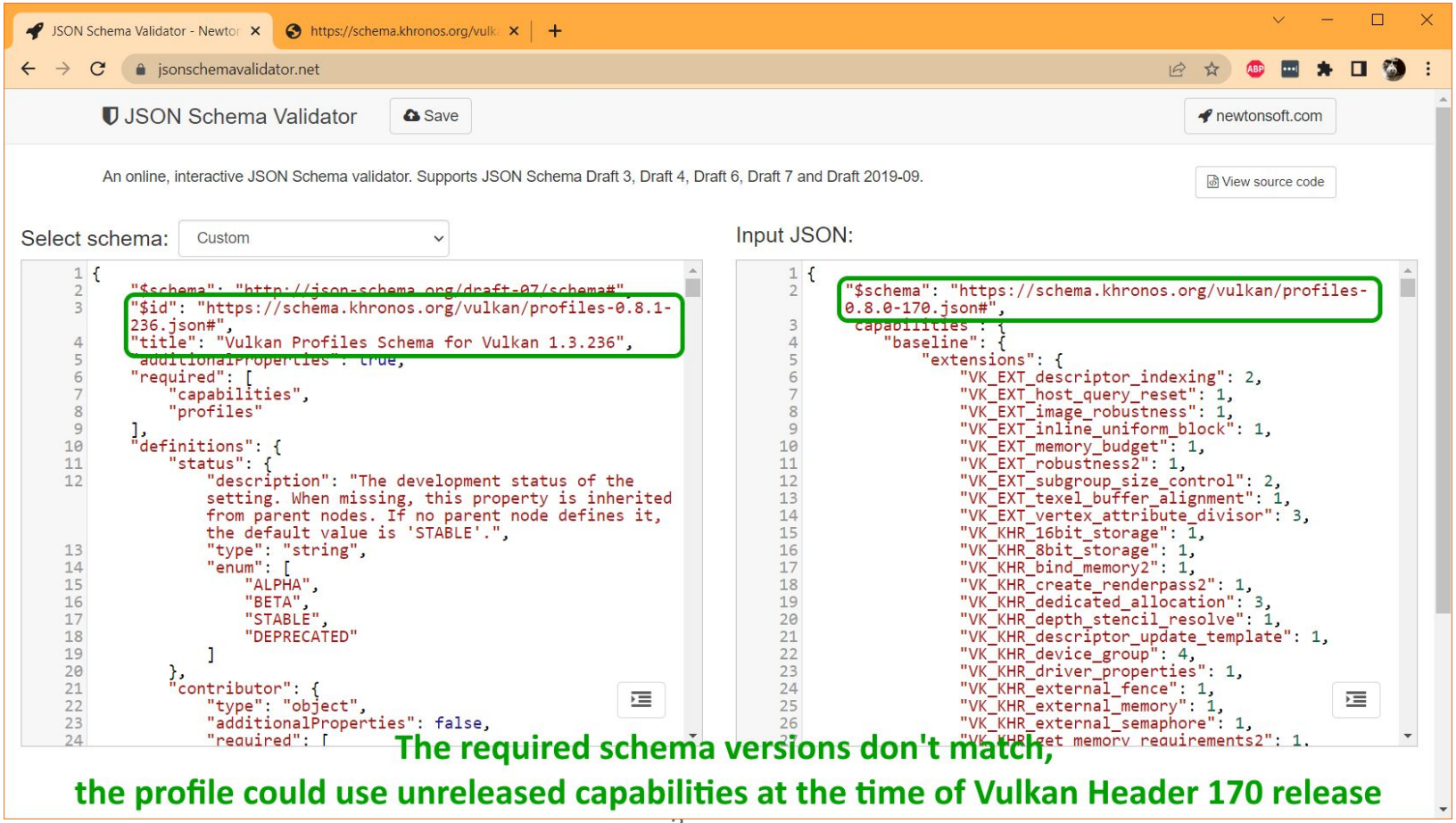
Size
__pycache__ 30/01/2023 17:10 File folder
VK_LUNARG_desktop_baseline_2023 30/01/2023 17:02 File folder
gen_profiles_file.py 13/12/2022 18:20 JetBrains PyCharm ... 45 KB
gen_profiles_solution.py 13/12/2022 18:20 JetBrains PyCharm ... 215 KB
profiles-0.8-latest.json 13/12/2022 18:20 JSON File 358 KB
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
9 items | 1 item selected 101 KB


E:\VulkanSDK\1.3.236.0\share\vulkan\registry
File
Home
Share
View
This PC
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 17:14 JSON File 102 KB
9 items | 1 item selected 357 KB |

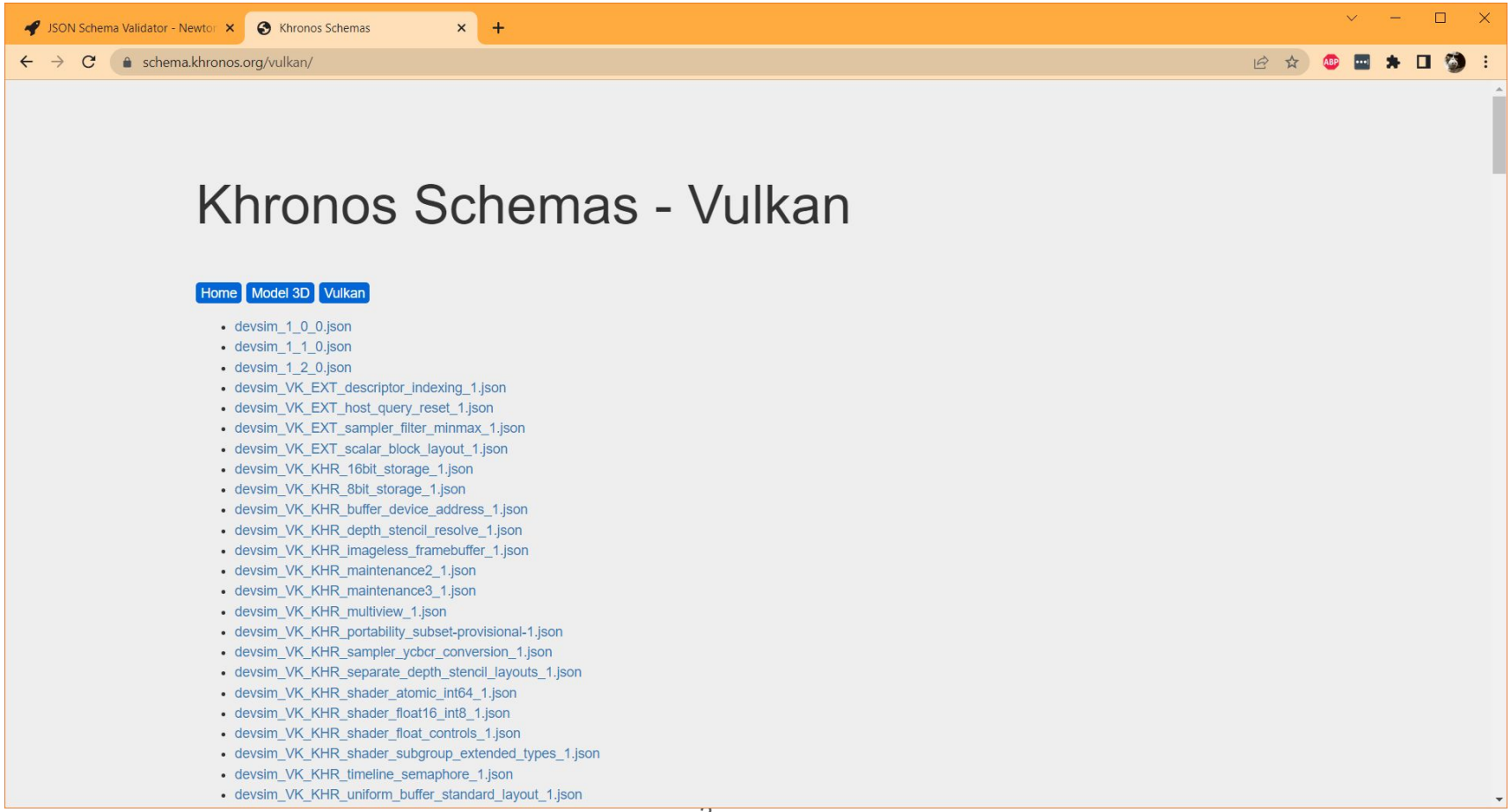

JSON Schema Validator - Newton
https://schema.khronos.org/vulk
jsonschemavalidator.net
JSON Schema Validator
Save
newtonsoft.com
An online, interactive JSON Schema validator. Supports JSON Schema Draft 3, Draft 4, Draft 6, Draft 7 and Draft 2019-09.
View source code
Select schema:
Custom
Profiles Schema
Input JSON: VP_LUNARG_desktop_baseline_2023
{
"$schema": "http://json-schema.org/draft-07/schema#",
"$id": "https://schema.khronos.org/vulkan/profiles-0.8.1-236.json#",
"title": "Vulkan Profiles Schema for Vulkan 1.3.236",
"additionalProperties": true,
"required": [
"capabilities",
"profiles"
],
"definitions": {
"status": {
"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'.",
"type": "string",
"enum": [
"ALPHA",
"BETA",
"STABLE",
"DEPRECATED"
]
},
"contributor": {
"type": "object",
"additionalProperties": false,
"required": [
{
"$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-170.json#",
"capabilities": {
"baseline": {
"extensions": {
"VK_EXT_descriptor_indexing": 2,
"VK_EXT_host_query_reset": 1,
"VK_EXT_image_robustness": 1,
"VK_EXT_inline_uniform_block": 1,
"VK_EXT_memory_budget": 1,
"VK_EXT_robustness2": 1,
"VK_EXT_subgroup_size_control": 2,
"VK_EXT_texel_buffer_alignment": 1,
"VK_EXT_vertex_attribute_divisor": 3,
"VK_KHR_16bit_storage": 1,
"VK_KHR_8bit_storage": 1,
"VK_KHR_bind_memory2": 1,
"VK_KHR_create_renderpass2": 1,
"VK_KHR_dedicated_allocation": 3,
"VK_KHR_depth_stencil_resolve": 1,
"VK_KHR_descriptor_update_template": 1,
"VK_KHR_device_group": 4,
"VK_KHR_driver_properties": 1,
"VK_KHR_external_fence": 1,
"VK_KHR_external_memory": 1,
"VK_KHR_external_semaphore": 1,
"VK_KHR_get_memory_requirements2": 1,
No errors found. JSON validates against the schema



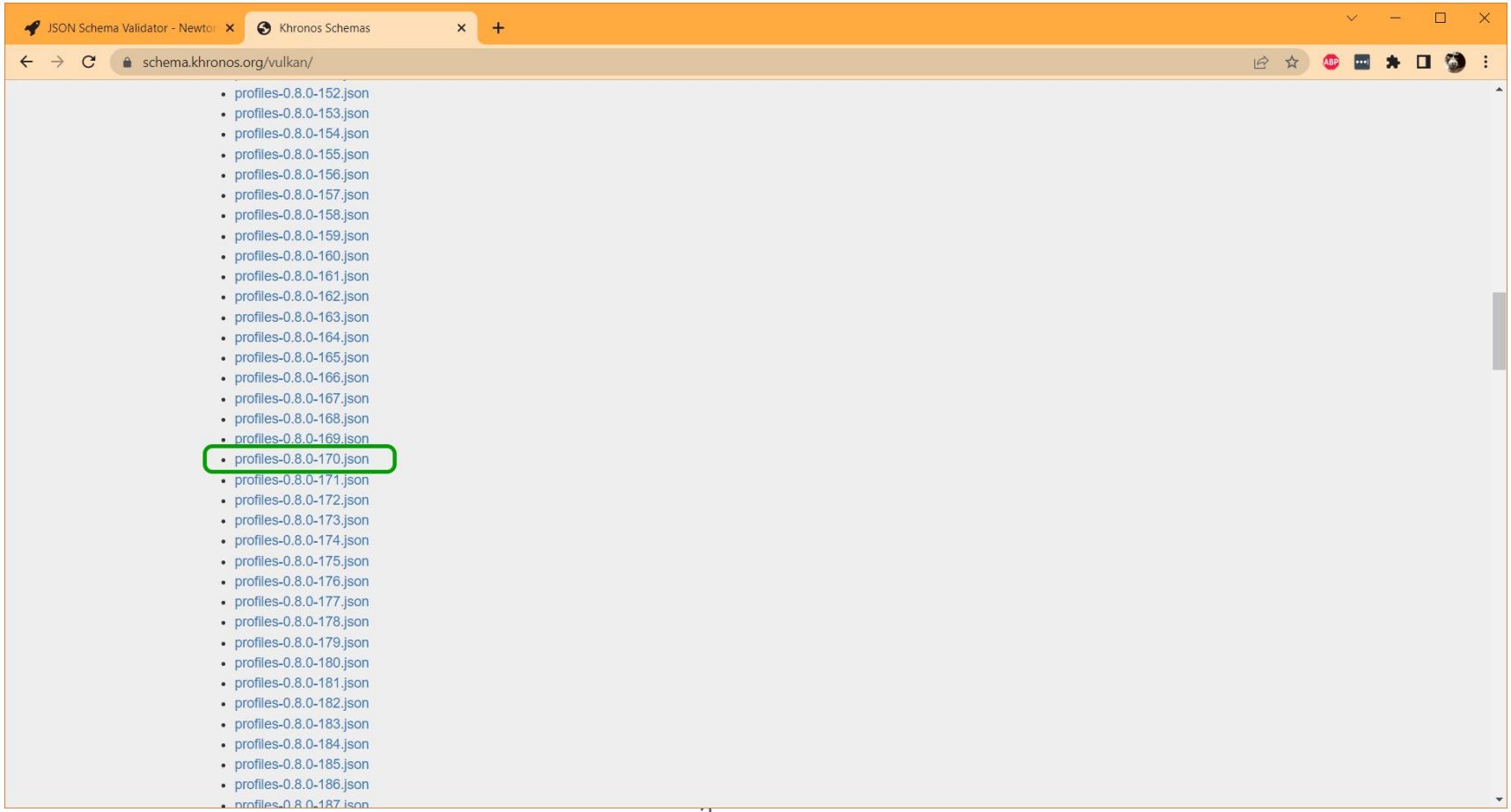
The required schema versions don't match,

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

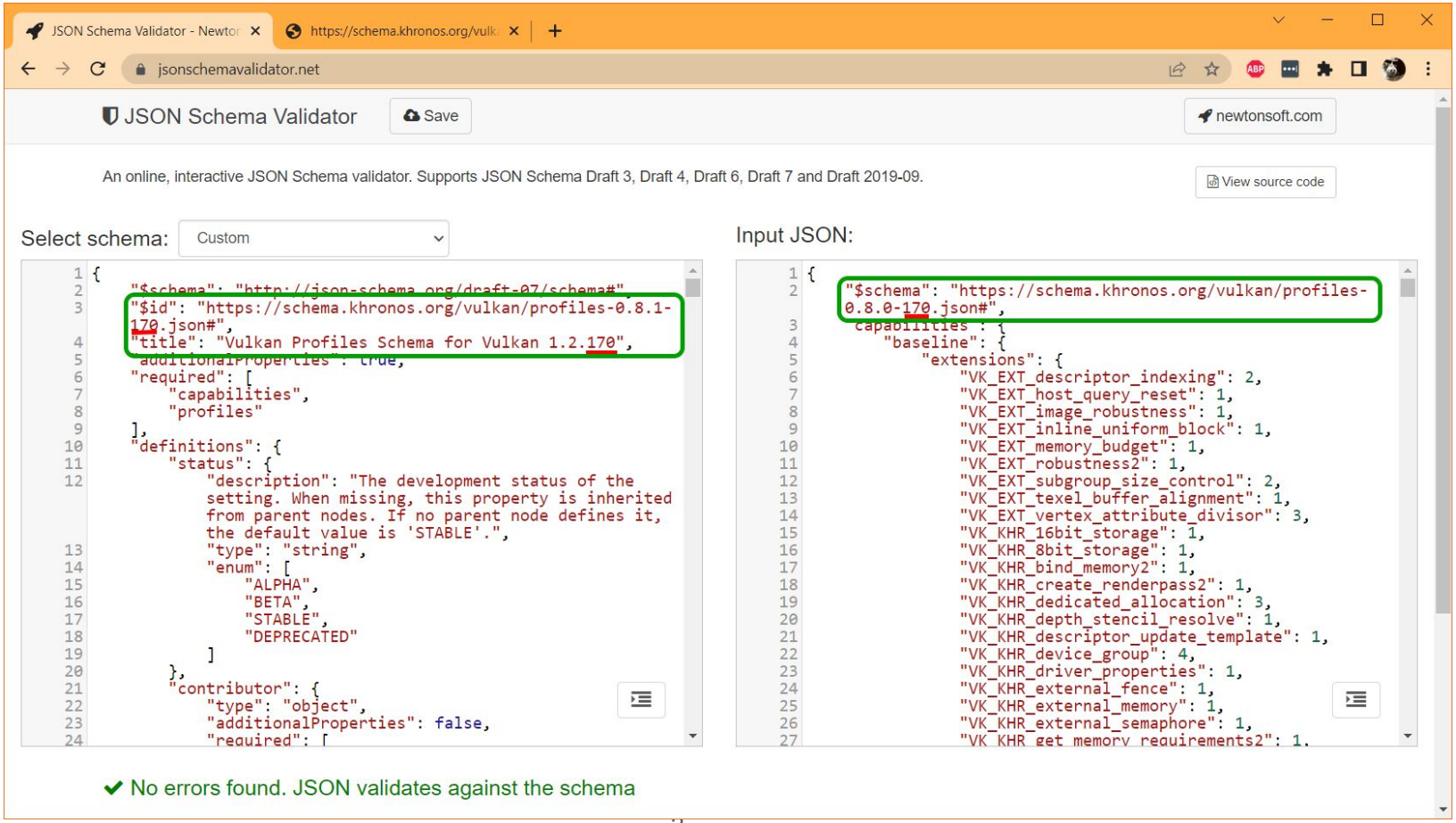
LUNARG

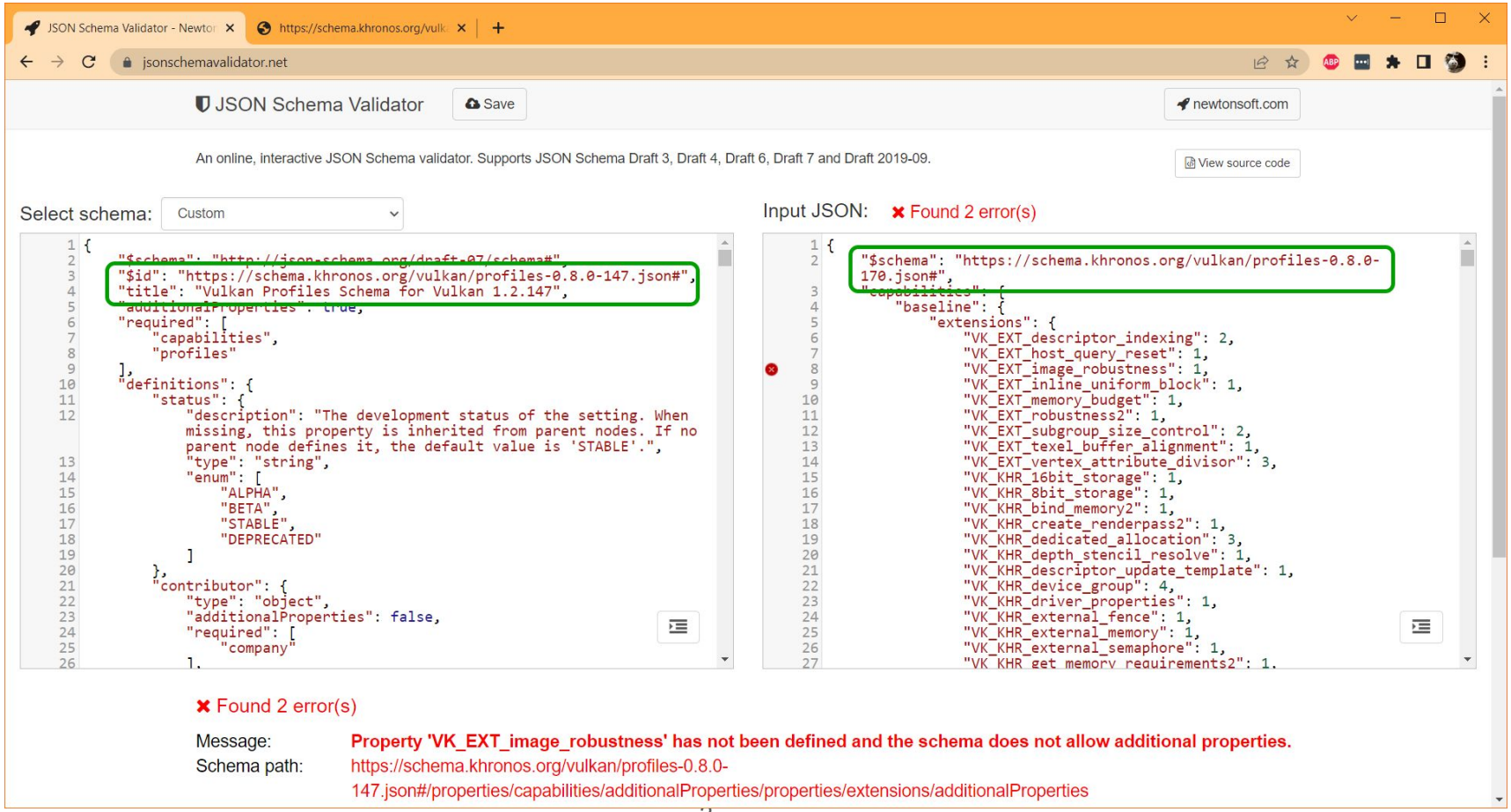

JSON Schema Validator - Newto
Khronos Schemas
schema.khronos.org/vulkan/
Khronos Schemas - Vulkan
Home
Model 3D
Vulkan
devsim_1_0_0.json
devsim_1_1_0.json
devsim_1_2_0.json
devsim_VK_EXT_descriptor_indexing_1.json
devsim_VK_EXT_host_query_reset_1.json
devsim_VK_EXT_sampler_filter_minmax_1.json
devsim_VK_EXT_scalar_block_layout_1.json
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

LUNARG


JSON Schema Validator - Newto
Khronos Schemas
schema.khronos.org/vulkan/
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

LUNARG


JSON Schema Validator - Newtor
https://schema.khronos.org/vulk
jsonschemavalidator.net
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
Input JSON:
{
"$schema": "http://json-schema.org/draft-07/schema#",
"$id": "https://schema.khronos.org/vulkan/profiles-0.8.1-170.json#",
"title": "Vulkan Profiles Schema for Vulkan 1.2.170",
"additionalProperties": true,
"required": [
"capabilities",
"profiles"
],
"definitions": {
"status": {
"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'.",
"type": "string",
"enum": [
"ALPHA",
"BETA",
"STABLE",
"DEPRECATED"
]
},
"contributor": {
"type": "object",
"additionalProperties": false,
"required": [
{
"$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-170.json#",
"capabilities": {
"baseline": {
"extensions": {
"VK_EXT_descriptor_indexing": 2,
"VK_EXT_host_query_reset": 1,
"VK_EXT_image_robustness": 1,
"VK_EXT_inline_uniform_block": 1,
"VK_EXT_memory_budget": 1,
"VK_EXT_robustness2": 1,
"VK_EXT_subgroup_size_control": 2,
"VK_EXT_texel_buffer_alignment": 1,
"VK_EXT_vertex_attribute_divisor": 3,
"VK_KHR_16bit_storage": 1,
"VK_KHR_8bit_storage": 1,
"VK_KHR_bind_memory2": 1,
"VK_KHR_create_renderpass2": 1,
"VK_KHR_dedicated_allocation": 3,
"VK_KHR_depth_stencil_resolve": 1,
"VK_KHR_descriptor_update_template": 1,
"VK_KHR_device_group": 4,
"VK_KHR_driver_properties": 1,
"VK_KHR_external_fence": 1,
"VK_KHR_external_memory": 1,
"VK_KHR_external_semaphore": 1,
"VK_KHR_get_memory_requirements2": 1,
No errors found. JSON validates against the schema


JSON Schema Validator - Newto
https://schema.khronos.org/vulk
jsonschemavalidator.net
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
Input JSON:
Found 2 error(s)
{
"$schema": "http://json-schema.org/draft-07/schema#",
"$id": "https://schema.khronos.org/vulkan/profiles-0.8.0-147.json#",
"title": "Vulkan Profiles Schema for Vulkan 1.2.147",
"additionalProperties": true,
"required": [
"capabilities",
"profiles"
],
"definitions": {
"status": {
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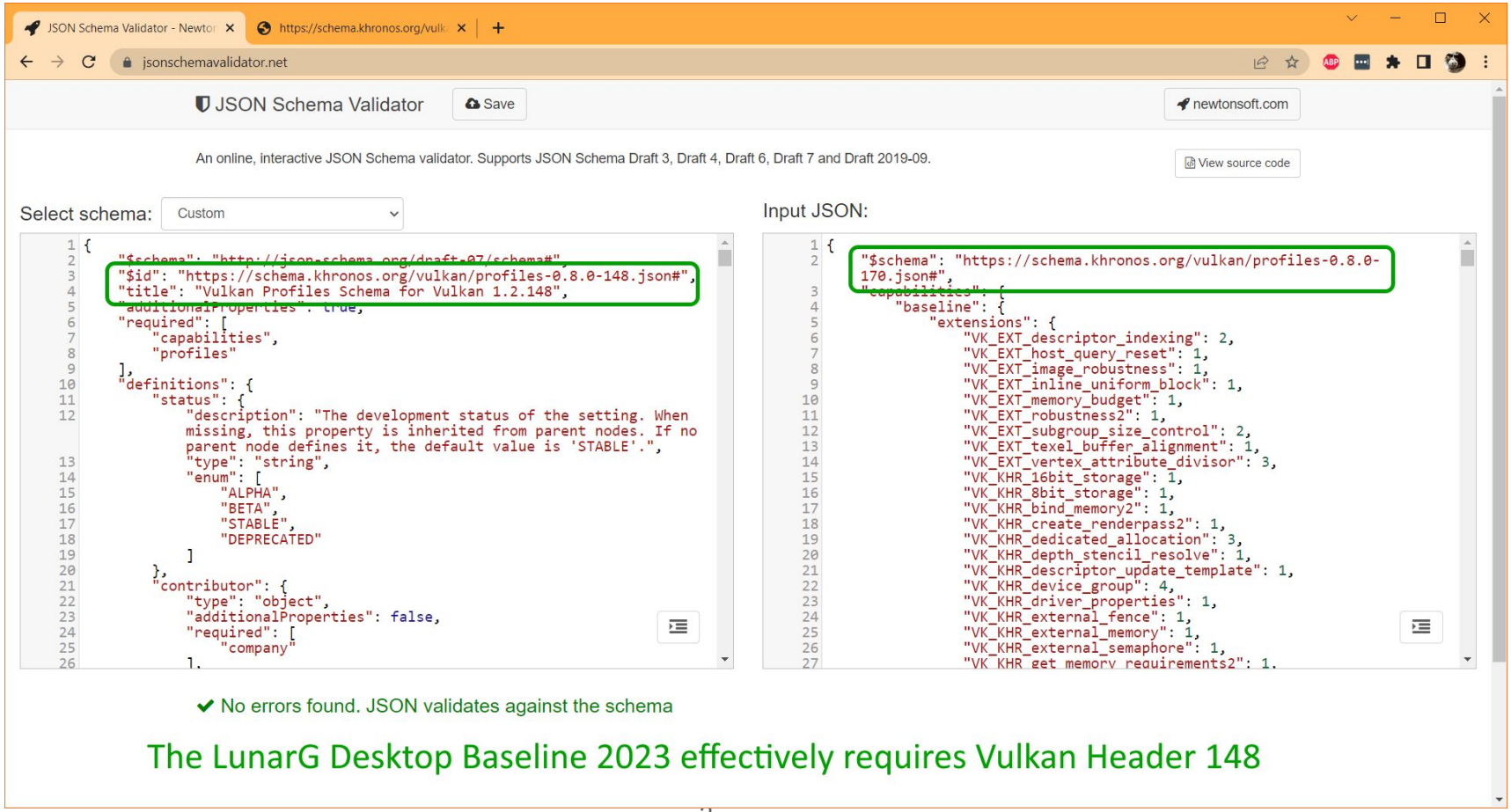
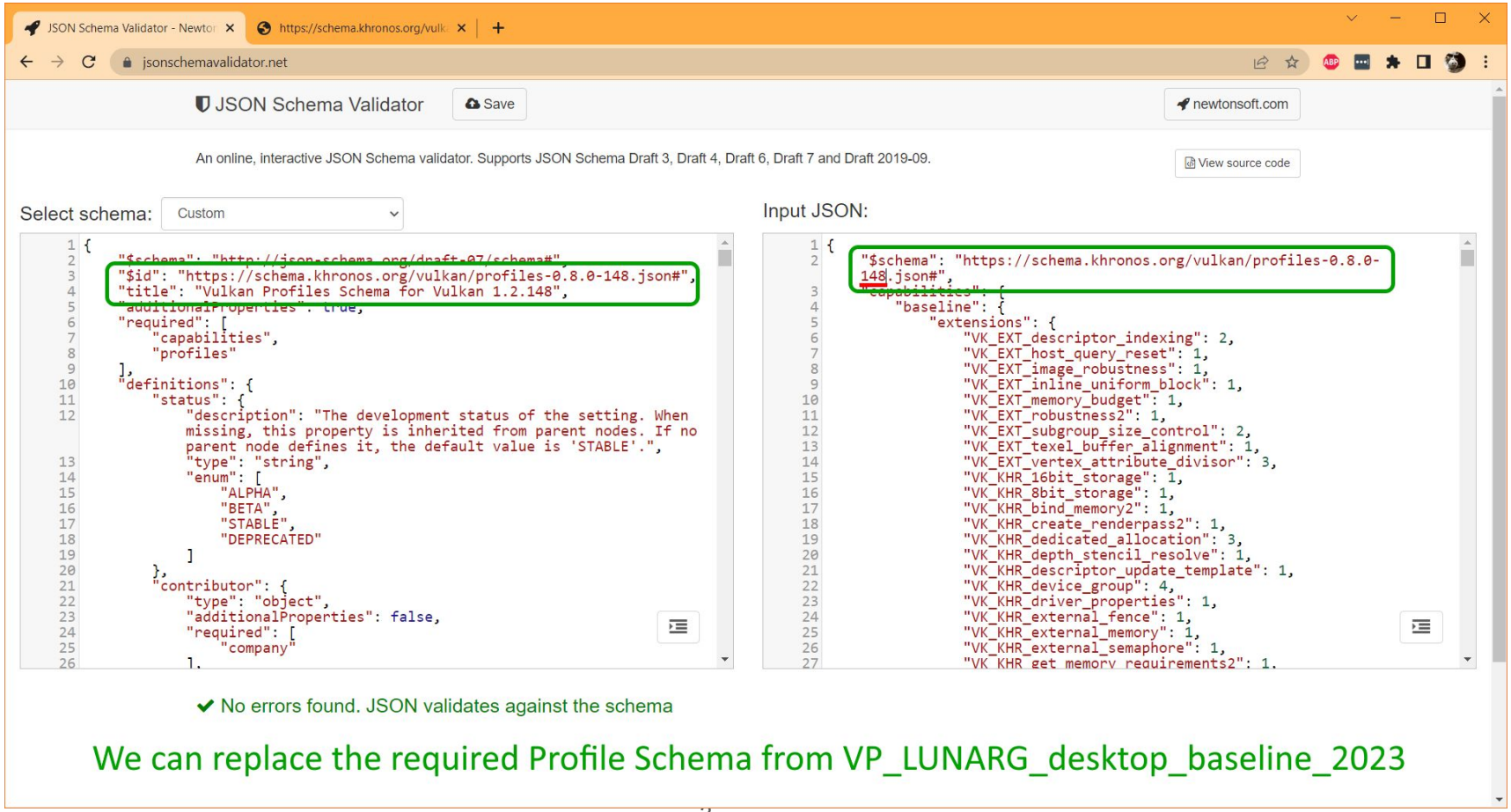
"type": "string",
"enum": [
"ALPHA",
"BETA",
"STABLE",
"DEPRECATED"
]
},
"contributor": {
"type": "object",
"additionalProperties": false,
"required": [
"company"
],
{
"$schema": "https://schema.khronos.org/vulkan/profiles-0.8.0-170.json#",
"capabilities": {
"baseline": {
"extensions": {
"VK_EXT_descriptor_indexing": 2,
"VK_EXT_host_query_reset": 1,
"VK_EXT_image_robustness": 1,
"VK_EXT_inline_uniform_block": 1,
"VK_EXT_memory_budget": 1,
"VK_EXT_robustness2": 1,
"VK_EXT_subgroup_size_control": 2,
"VK_EXT_texel_buffer_alignment": 1,
"VK_EXT_vertex_attribute_divisor": 3,
"VK_KHR_16bit_storage": 1,
"VK_KHR_8bit_storage": 1,
"VK_KHR_bind_memory2": 1,
"VK_KHR_create_renderpass2": 1,
"VK_KHR_dedicated_allocation": 3,
"VK_KHR_depth_stencil_resolve": 1,
"VK_KHR_descriptor_update_template": 1,
"VK_KHR_device_group": 4,
"VK_KHR_driver_properties": 1,
"VK_KHR_external_fence": 1,
"VK_KHR_external_memory": 1,
"VK_KHR_external_semaphore": 1,
"VK_KHR_get_memory_requirements2": 1,
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



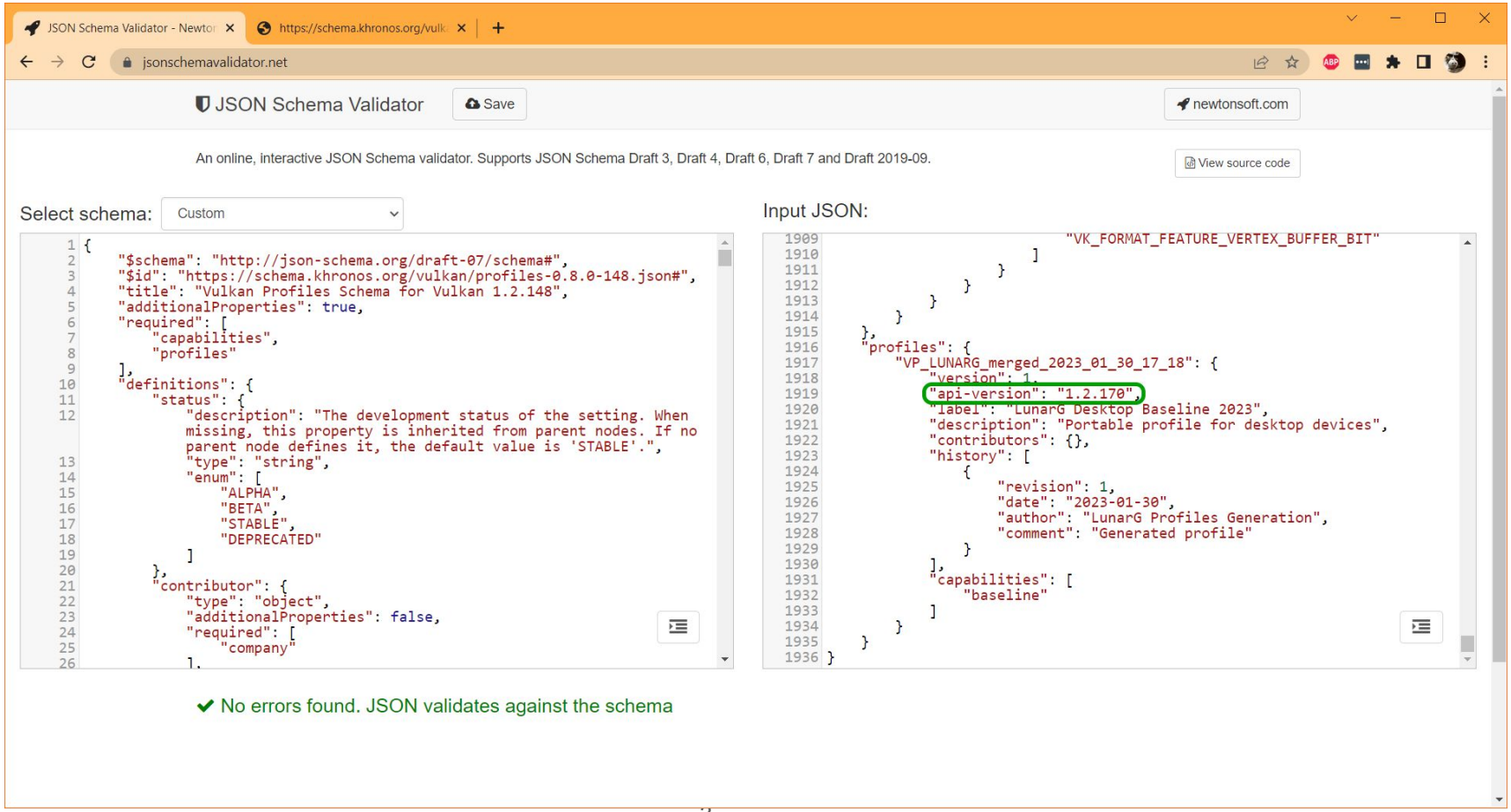
The LunarG Desktop Baseline 2023 effectively requires Vulkan Header 148

LUNARG



We can replace the required Profile Schema from VP_LUNARG_desktop_baseline_2023

LUNARG


JSON Schema Validator - Newto
https://schema.khronos.org/vulk
jsonschemavalidator.net
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
Input JSON:
{
"$schema": "http://json-schema.org/draft-07/schema#",
"$id": "https://schema.khronos.org/vulkan/profiles-0.8.0-148.json#",
"title": "Vulkan Profiles Schema for Vulkan 1.2.148",
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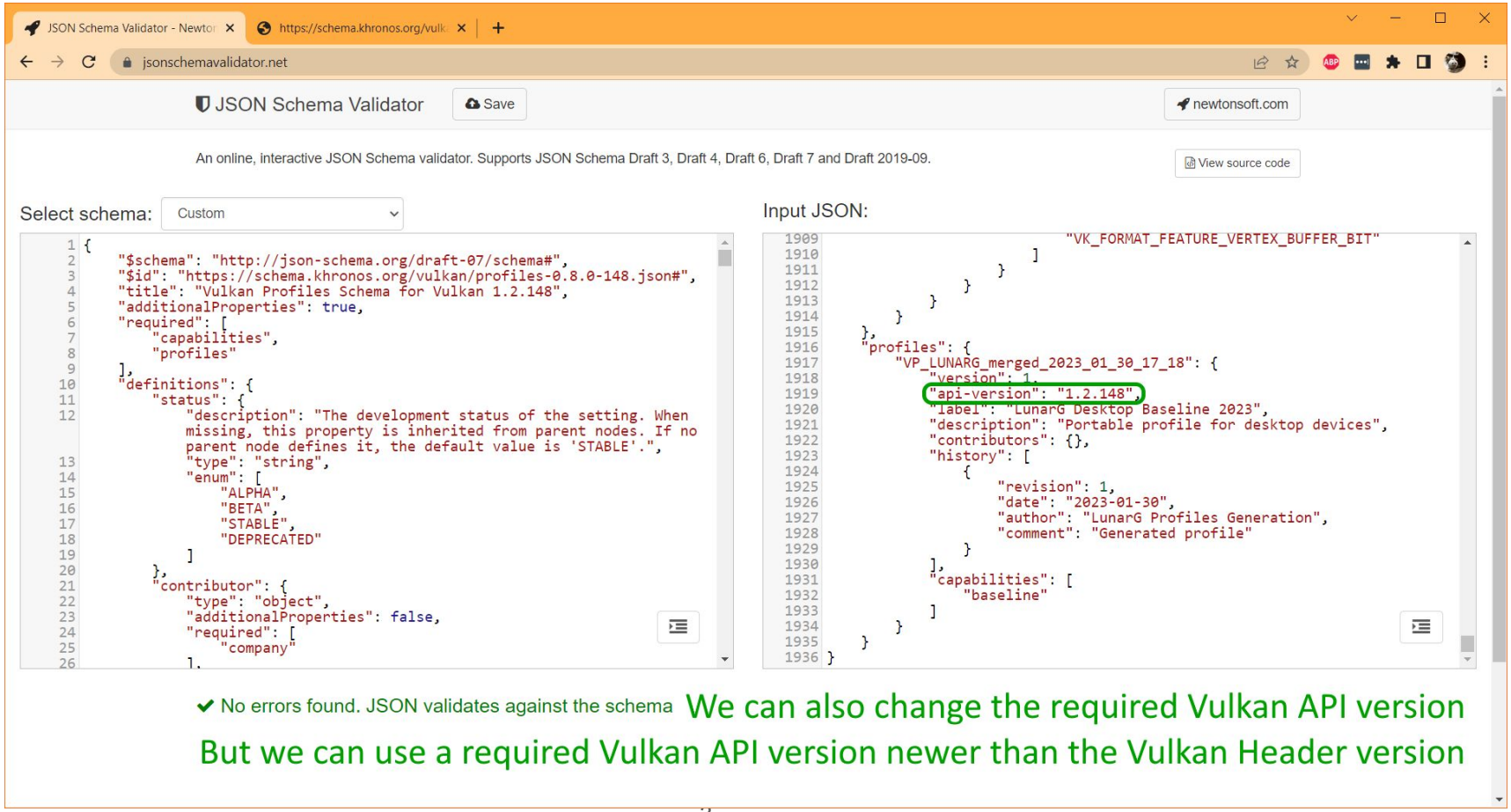
"required": [
"capabilities",
"profiles"
],
"definitions": {
"status": {
"description": "The development status of the setting. When missing, this property is inherited from parent nodes. If no parent node defines it, the default value is 'STABLE'.",
"type": "string",
"enum": [
"ALPHA",
"BETA",
"STABLE",
"DEPRECATED"
]
},
"contributor": {
"type": "object",
"additionalProperties": false,
"required": [
"company"
"VK_FORMAT_FEATURE_VERTEX_BUFFER_BIT"
"profiles": {
"VP_LUNARG_merged_2023_01_30_17_18": {
"version": 1,
"api-version": "1.2.170",
"label": "LunarG Desktop Baseline 2023",
"description": "Portable profile for desktop devices",
"contributors": {},
"history": [
"revision": 1,
"date": "2023-01-30",
"author": "LunarG Profiles Generation",
"comment": "Generated profile"
"capabilities": [
"baseline"
No errors found. JSON validates against the schema


JSON Schema Validator - Newto
https://schema.khronos.org/vulk
jsonschemavalidator.net
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
Input JSON:
{
"$schema": "http://json-schema.org/draft-07/schema#",
"$id": "https://schema.khronos.org/vulkan/profiles-0.8.0-148.json#",
"title": "Vulkan Profiles Schema for Vulkan 1.2.148",
"additionalProperties": true,
"required": [
"capabilities",
"profiles"
],
"definitions": {
"status": {
"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'.",
"type": "string",
"enum": [
"ALPHA",
"BETA",
"STABLE",
"DEPRECATED"
]
},
"contributor": {
"type": "object",
"additionalProperties": false,
"required": [
"company"
"VK_FORMAT_FEATURE_VERTEX_BUFFER_BIT"
"profiles": {
"VP_LUNARG_merged_2023_01_30_17_18": {
"version": 1,
"api-version": "1.2.148",
"label": "LunarG Desktop Baseline 2023",
"description": "Portable profile for desktop devices",
"contributors": {},
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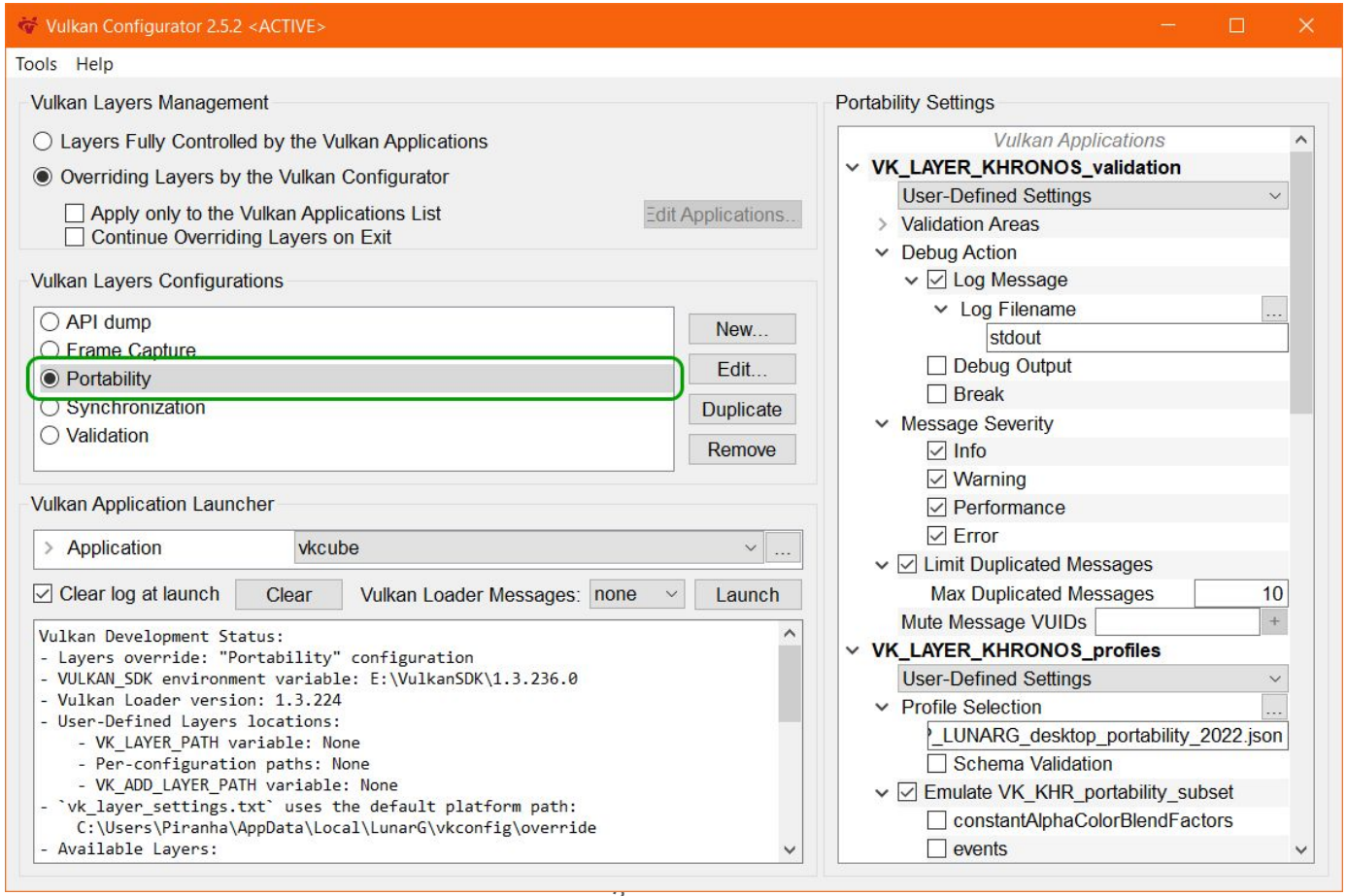
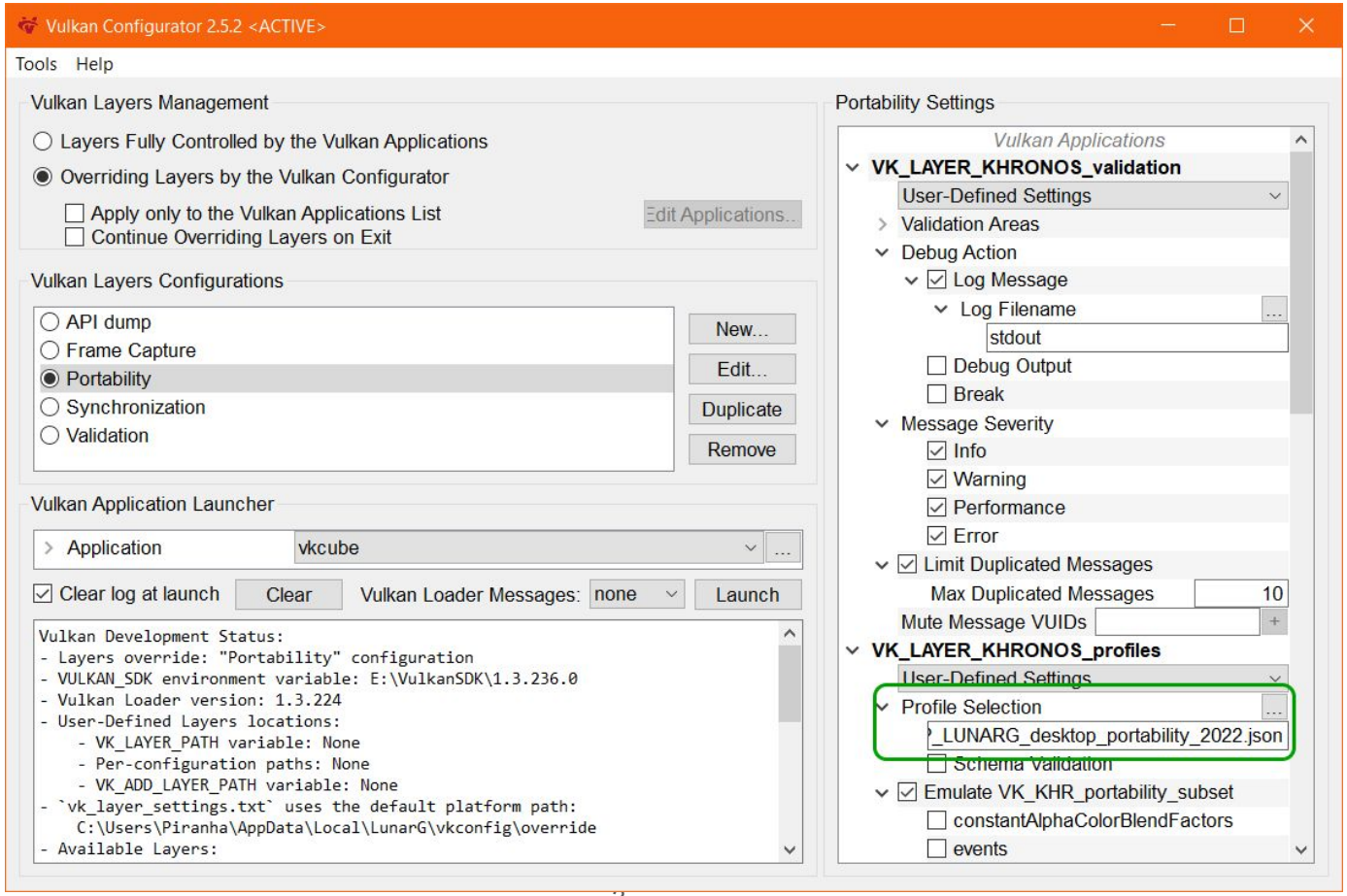
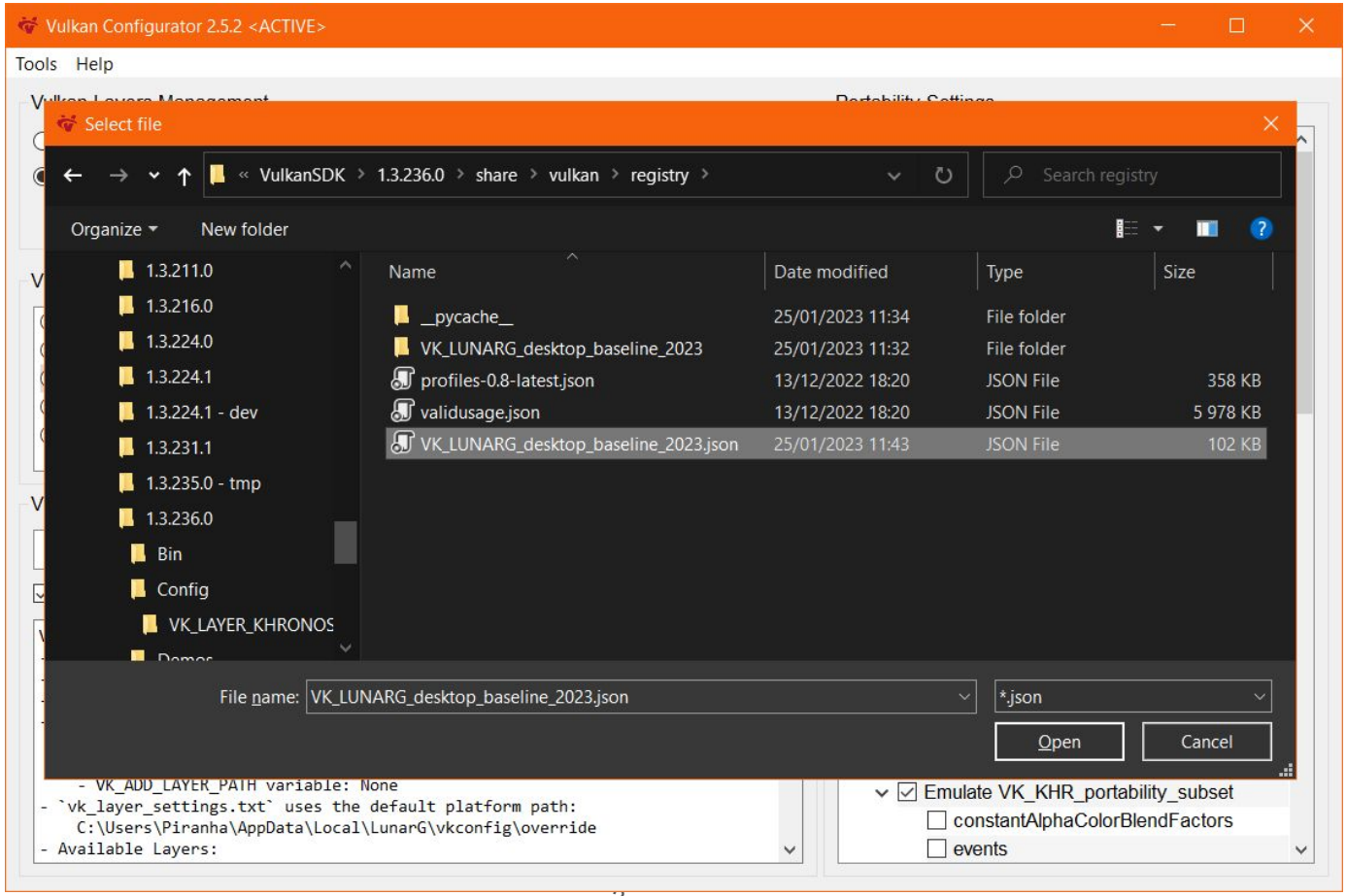
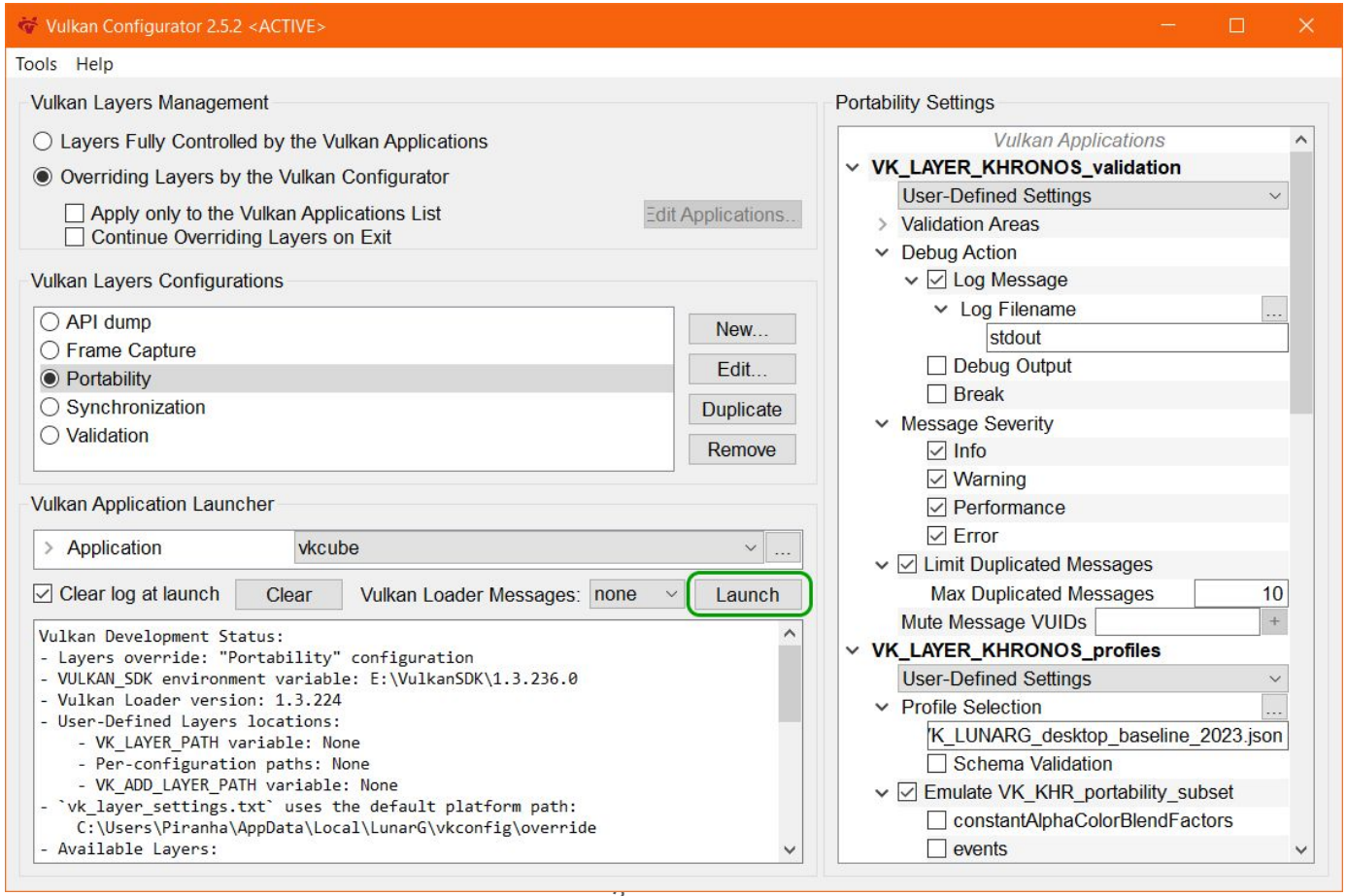
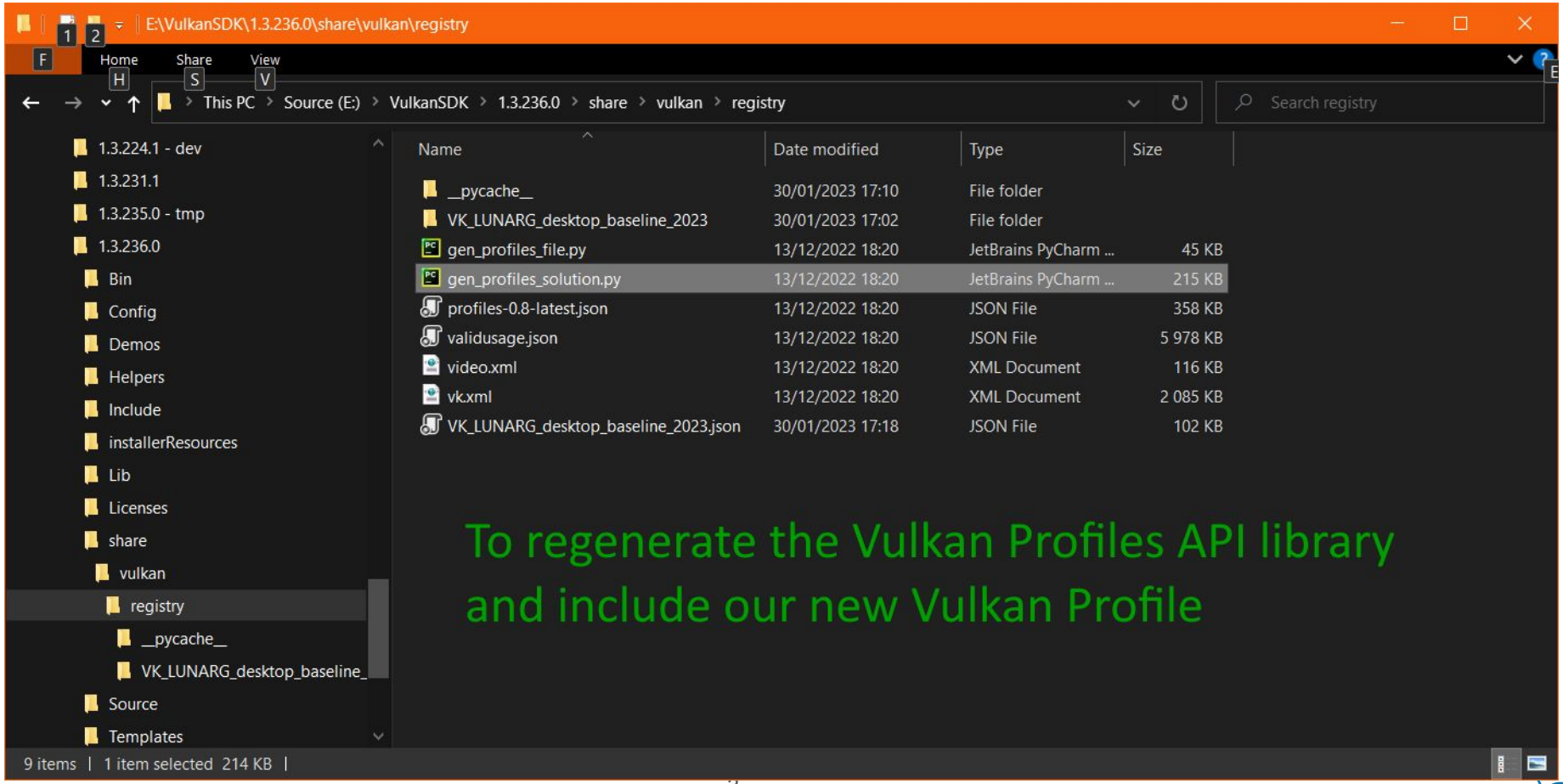
"date": "2023-01-30",
"author": "LunarG Profiles Generation",
"comment": "Generated profile"
"capabilities": [
"baseline"
No errors found. JSON validates against the schema
We can also change the required Vulkan API version
But we can use a required Vulkan API version newer than the Vulkan Header version

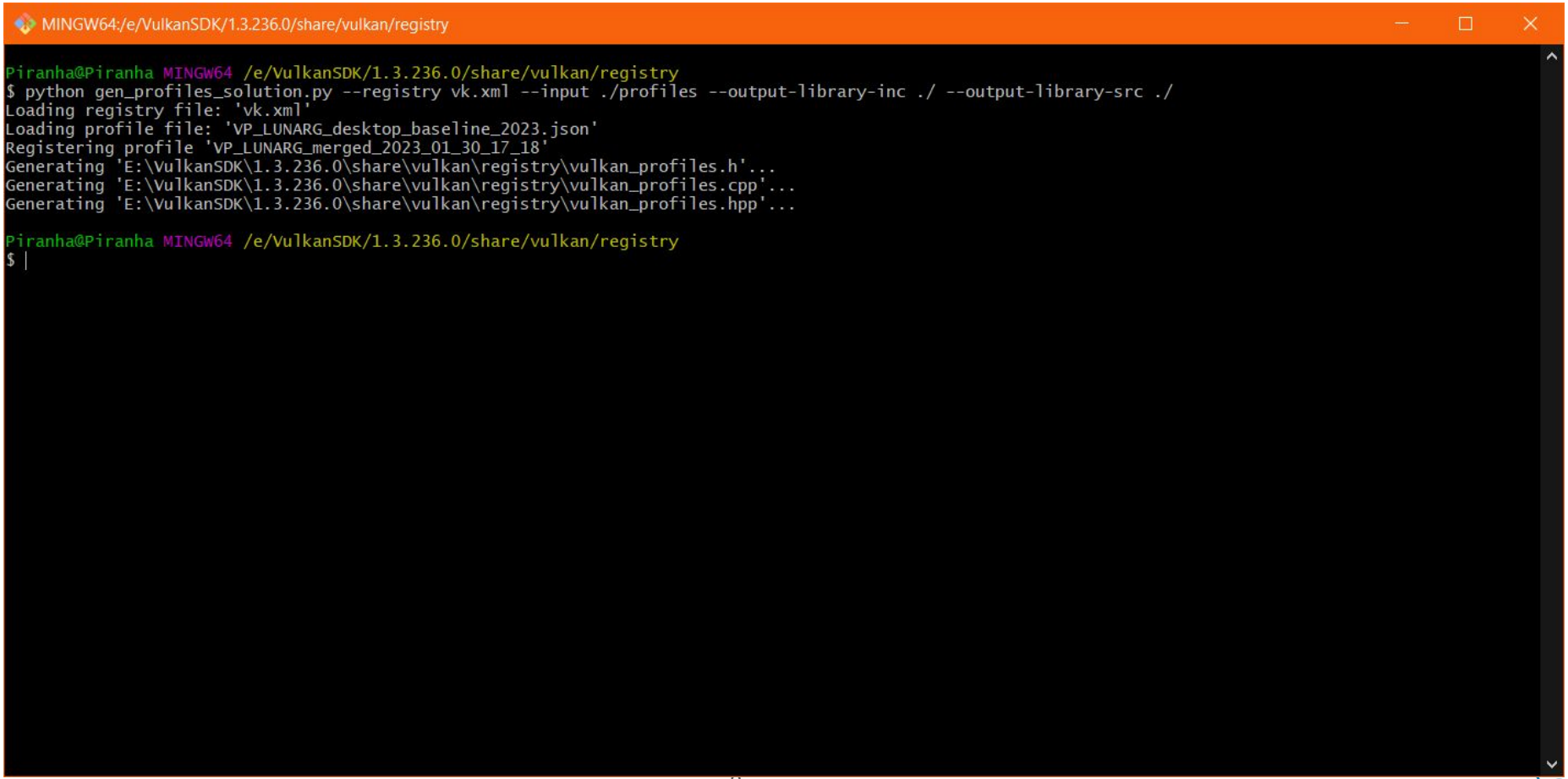

Vulkan Configurator 2.5.2 <ACTIVE>
Tools Help
Vulkan Layers Management
Layers Fully Controlled by the Vulkan Applications
Overriding Layers by the Vulkan Configurator
Apply only to the Vulkan Applications List
Continue Overriding Layers on Exit
Edit Applications...
Vulkan Layers Configurations
API dump
Frame Capture
Portability
Synchronization
Validation
New...
Edit...
Duplicate
Remove
Vulkan Application Launcher
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
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

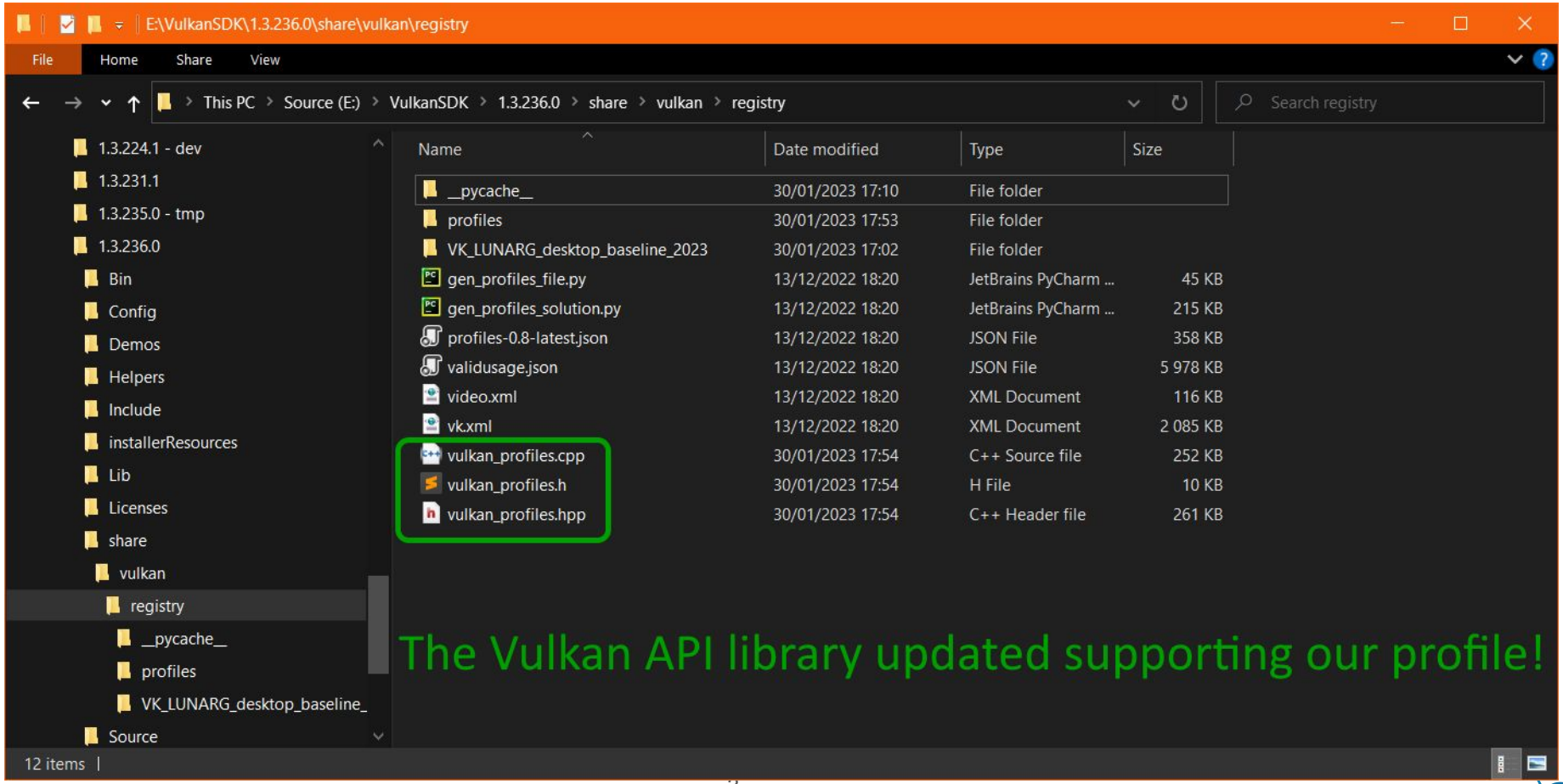

Vulkan Configurator 2.5.2 <ACTIVE>
Tools Help
Vulkan Layers Management
Layers Fully Controlled by the Vulkan Applications
Overriding Layers by the Vulkan Configurator
Apply only to the Vulkan Applications List
Continue Overriding Layers on Exit
Edit Applications...
Vulkan Layers Configurations
API dump
Frame Capture
Portability
Synchronization
Validation
New...
Edit...
Duplicate
Remove
Vulkan Application Launcher
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
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 Configurator 2.5.2 <ACTIVE>
Tools Help
Select file
« VulkanSDK › 1.3.236.0 › share › vulkan › registry ›
Search registry
Organize
New folder
1.3.211.0
1.3.216.0
1.3.224.0
1.3.224.1
1.3.224.1 - dev
1.3.231.1
1.3.235.0 - tmp
1.3.236.0
Bin
Config
VK_LAYER_KHRONOS
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 Configurator 2.5.2 <ACTIVE>
Tools Help
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
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
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
VK_LUNARG_desktop_baseline_2023.json
Schema Validation
Emulate VK_KHR_portability_subset
constantAlphaColorBlendFactors
events


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
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
To regenerate the Vulkan Profiles API library
and include our new Vulkan Profile
9 items | 1 item selected 214 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_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
$


E:\VulkanSDK\1.3.236.0\share\vulkan\registry
File
Home
Share
View
This PC
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__
profiles
VK_LUNARG_desktop_baseline_
Source
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
12 items
The Vulkan API library updated supporting our profile!

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

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

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

LUNARG

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

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References

[Android Dashboard]