Vulkan performance compared to OpenGL

Logan Wingard
No, Vulkan is not just faster replacement to OpenGL.

It is a low-level, high-performance alternative.
What Vulkan does differently

- SPIR-V bytecode format
  - Standard compliance
  - Allows both GLSL and HLSL
  - Decreased shader load times
- Separates operating system-dependant code
  - The ABI (application binary interface) handles communication between the game, OS, and graphics hardware
  - Allows for Device independence
Vulkan Benefits

- **Multi-threading**
  - Vulkan excels at multi-threading
- **GPU/CPU power consumption**
  - Vulkan greatly reduces CPU time in driver
- **Frame drops and stuttering**
  - Explicit operations available in vulkan (as opposed to OpenGL’s implicit resource management) can reduce an application’s sensitivity to frame drops
Doom 2016 benchmark
My benchmark

8 million cubes
OpenGL

Average fps: ~1
Took > 5 sec just to load
My benchmark

8 million cubes
Vulkan

Average fps: ~250

Loaded in < 1 sec
Why Vulkan is an alternative rather than a replacement

Vulkan being so low-level adds higher responsibility on the developer. Much of what OpenGL does is in the background, making it slower, yet simpler to implement.
Just for fun

Vulkan vs DirectX

Tested on this video
Questions?
Sources

https://www.pcgamer.com/doom-benchmarks-return-vulkan-vs-opengl/1/

https://www.khronos.org/opengl/wiki/Performance#Measuring_Performance


https://www.khronos.org/spir/

https://developer.nvidia.com/transitioning-opengl-vulkan