Realtà Virtuale – Politecnico di Torino

GRUPPO 8

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CHE COS'É VULKAN?

- API di basso livello per rendering 2D e 3D
- Erede di OpenGL «Next Generation OpenGL Initiative»
- Sviluppato da KHRONOS GROUP
- Dna di AMD Mantle

Vulkan™

KHRONOS GROUP

Marzo 2015: prima presentazione di Vulkan

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STRUTTURA MODULARE

Architettura comune per:

- Code Validation
- Debugging
- Profiling

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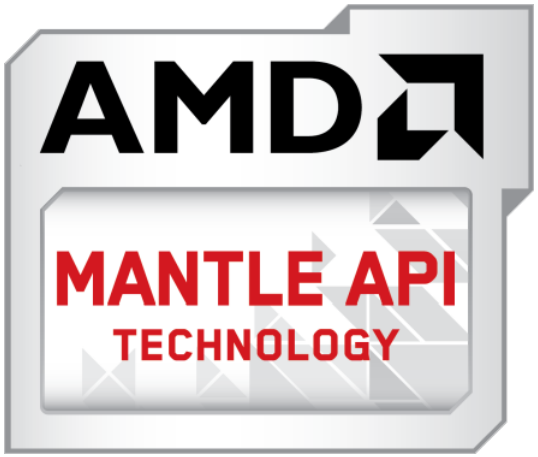
AMD MANTLE

Low overhead

Multi-Architettura



Controllo
diretto GPU

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THE THALOS PRINCIPLE

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FEATURES PRINCIPALI

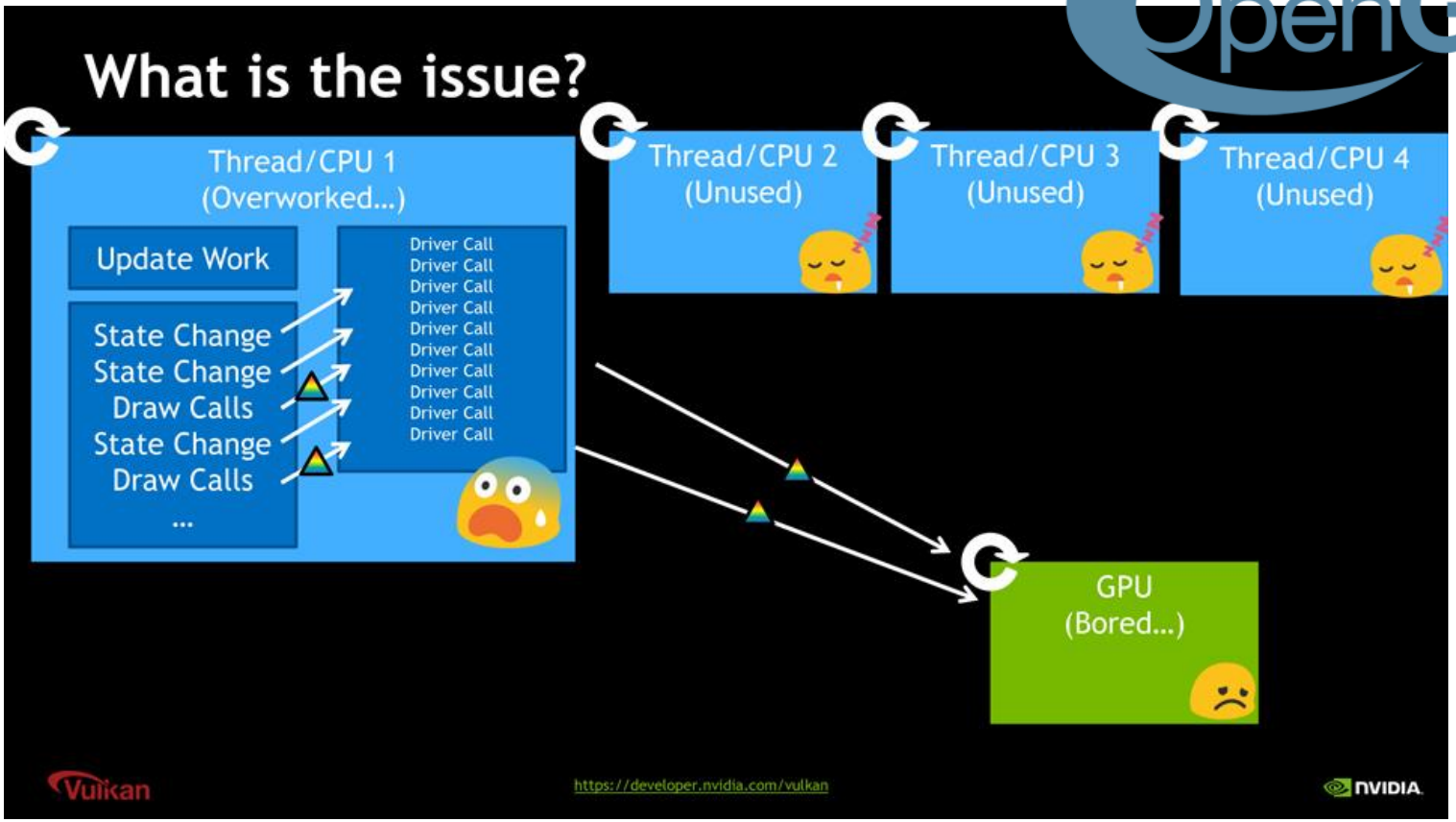
1. SPIR-V
2. Multithreading
3. Controllo diretto della GPU

1. SPIR-V

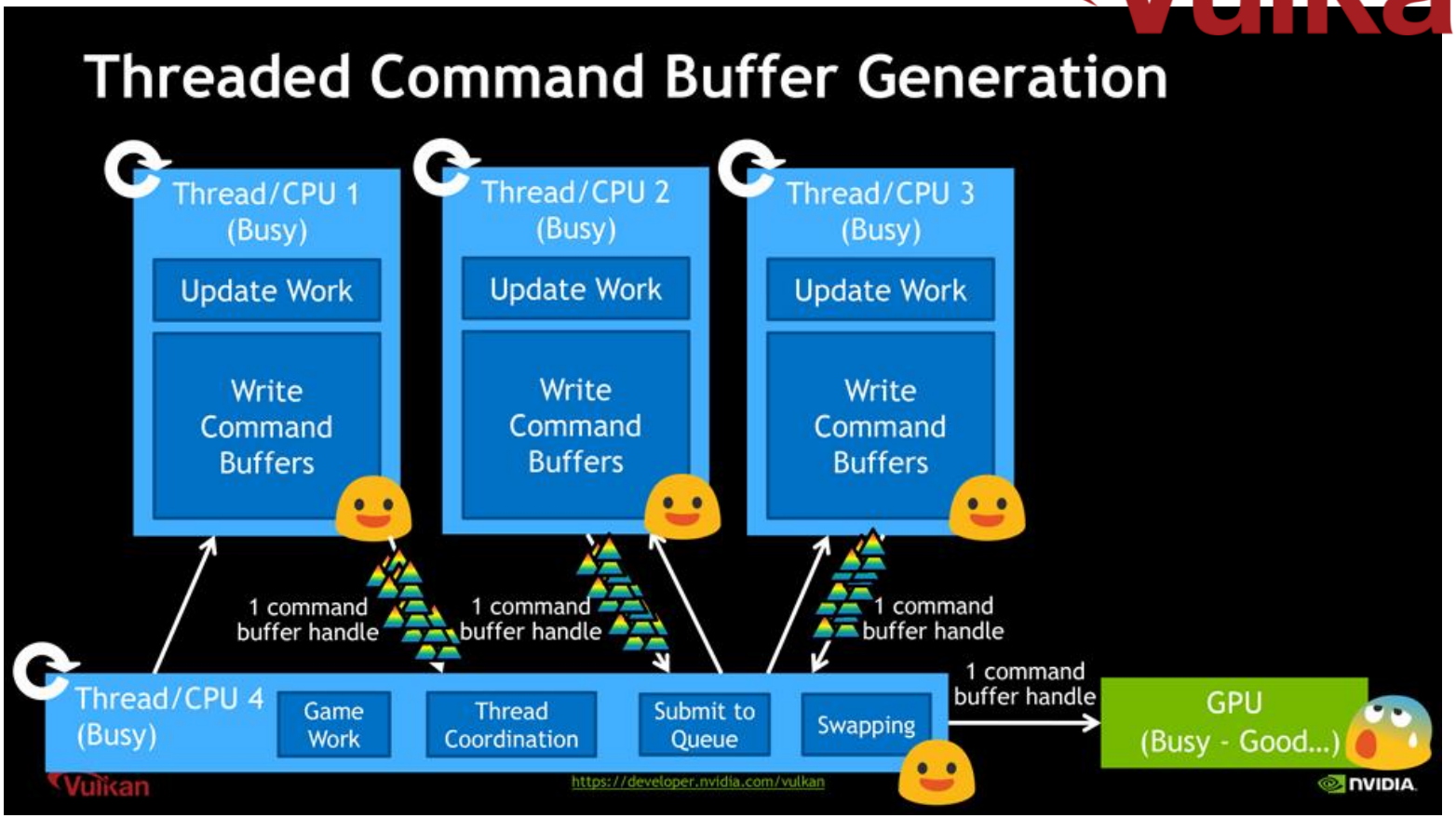
Innovativo linguaggio intermedio binario e platform-independent usato da Vulkan perchè:

- Permette di precompilare gli shader
- Permette di scrivere shader in linguaggi diversi da GLSL
- Alleggerisce il carico di lavoro sui driver della GPU

2. MULTITHREADING (I)

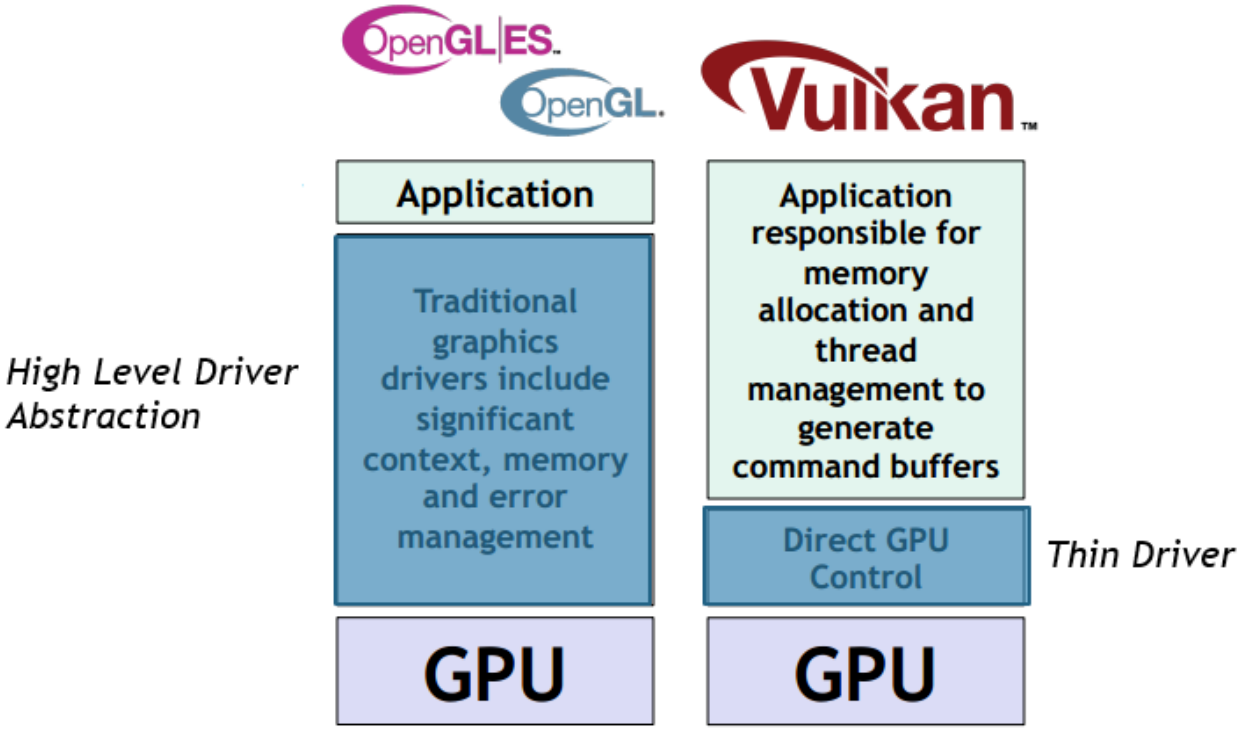


2. MULTITHREADING (II)



3. CONTROLLO DIRETTO DELLA GPU

Il controllo e la gestione della GPU sono spostate dai driver alle applicazioni. Questo permette l'utilizzo di MultiGPU a livello applicazione.



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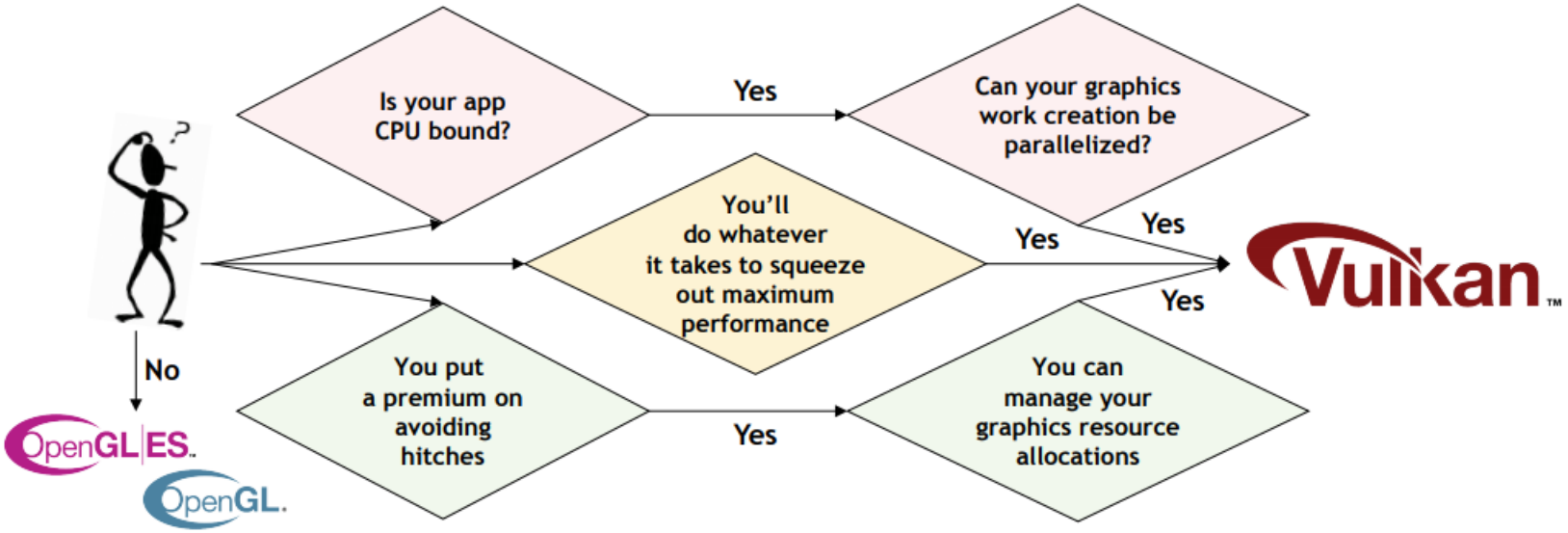
PERCHÉ SCEGLIERE VULKAN?



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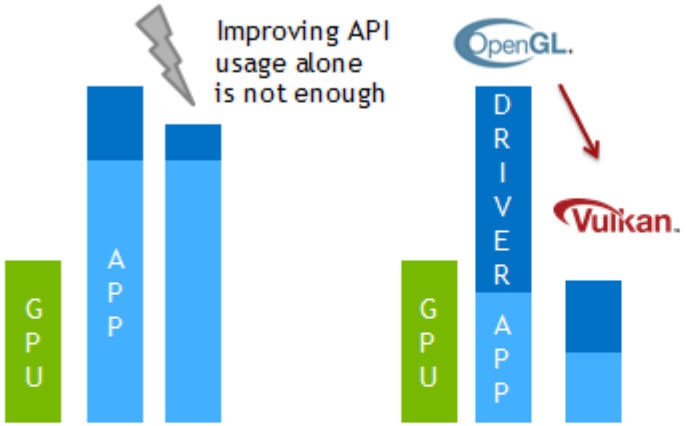
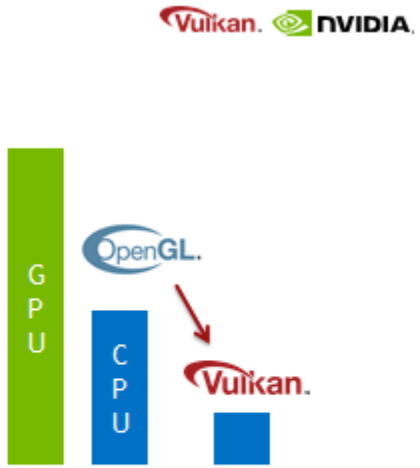
CONFRONTO CON OPENGL (I)



Not application CPU work limited:
Modernizing application code is often required to benefit from the additional control offered by Vulkan or modern OpenGL techniques.



GPU/CPU Ratio:
Vulkan can help reduce power consumption, but may not improve GPU workload situation.

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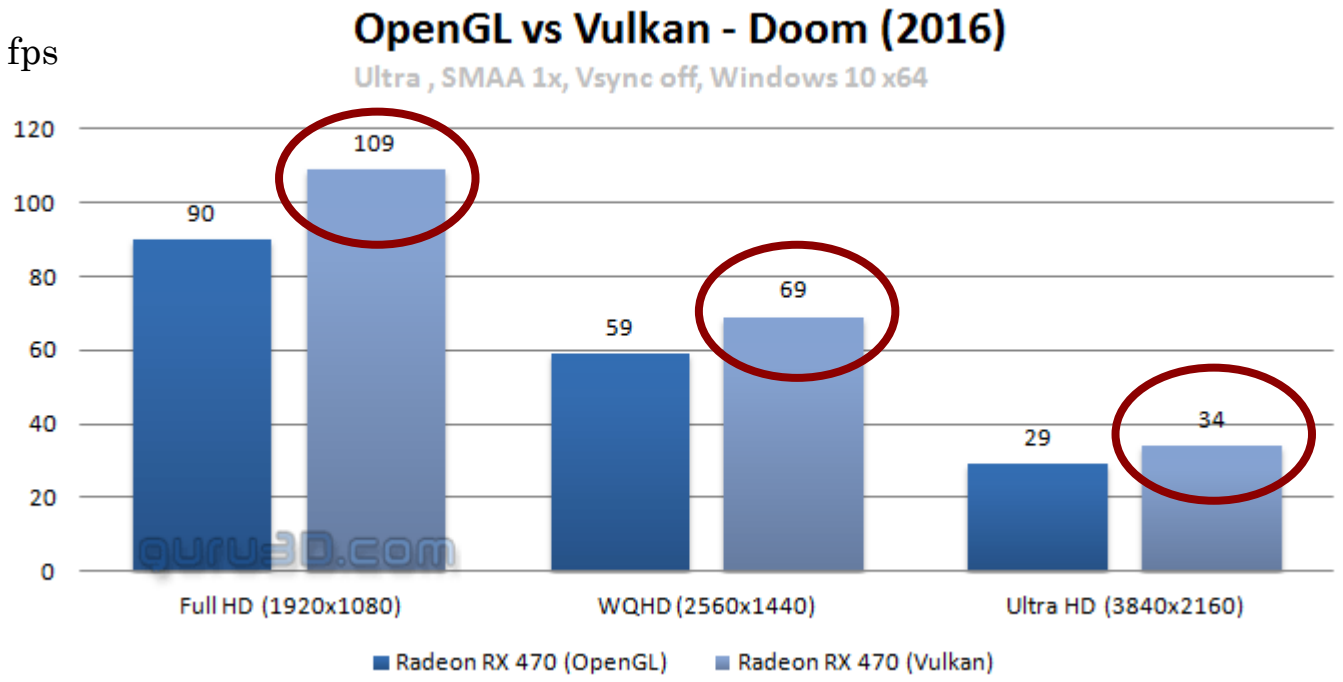
CONFRONTO CON OPENGL (II)



https://www.youtube.com/watch?v=lTdMaccYAlI

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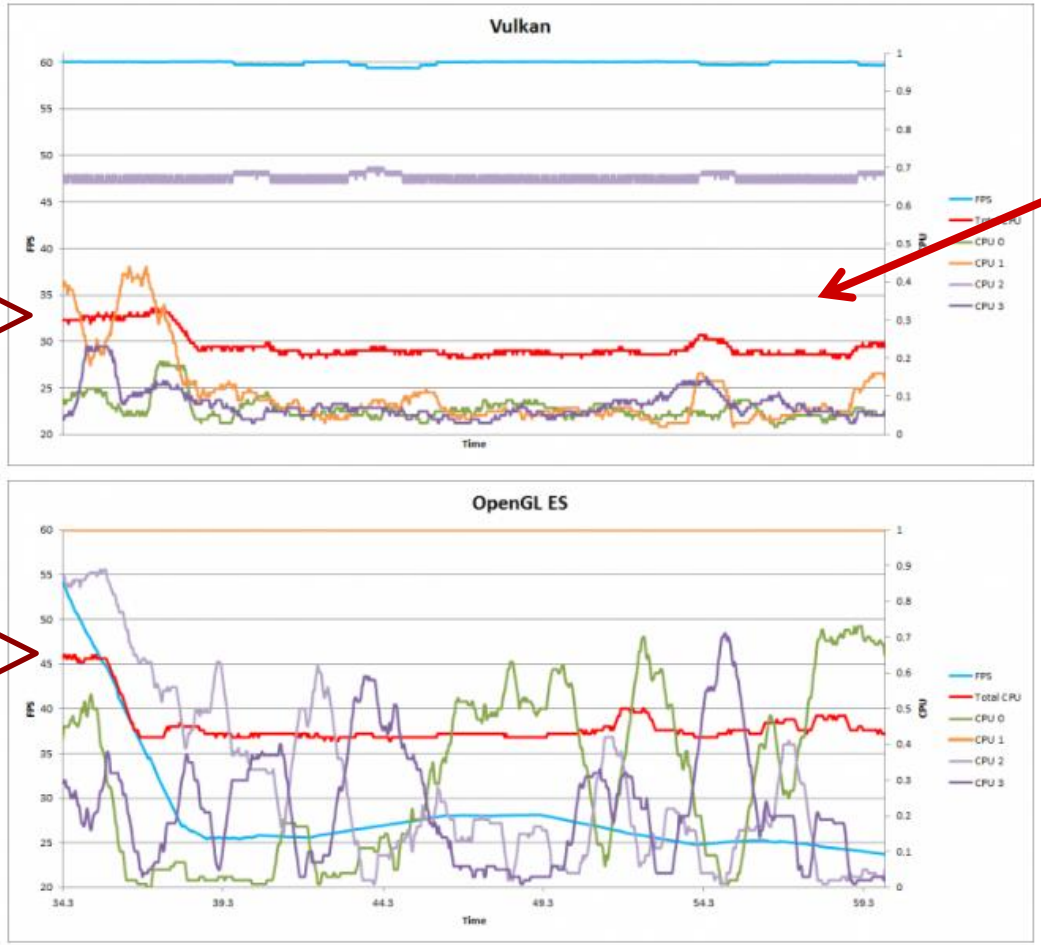
CONFRONTO CON OPENGL (II)



32% cpu peak workload

47% cpu peak workload

Andamento più lineare, meno picchi > **carico di lavoro più distribuito tra i core**

https://www.imgtec.com/blog/vulkan-3d-satnav-app-powervr

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VULKAN E VR

"The advantage that Vulkan will deliver in the end for the software developers creating VR experiences is that they will typically be able to create experiences that are faster and typically have lower latency. Vulkan is lower latency because the driver is much thinner and there are fewer steps to go through which leads to much less glitching."

(Neil Trevett, Vice President at NVIDIA)

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AVETE DOMANDE?

GRAZIE!

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