

What's new in the GPU virtual world?

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Summary

- What is virgl?
- Virgl through the year.
- Infrastructure, GitLab and CI.
- Plan for the future.
- Q&A and discussion.



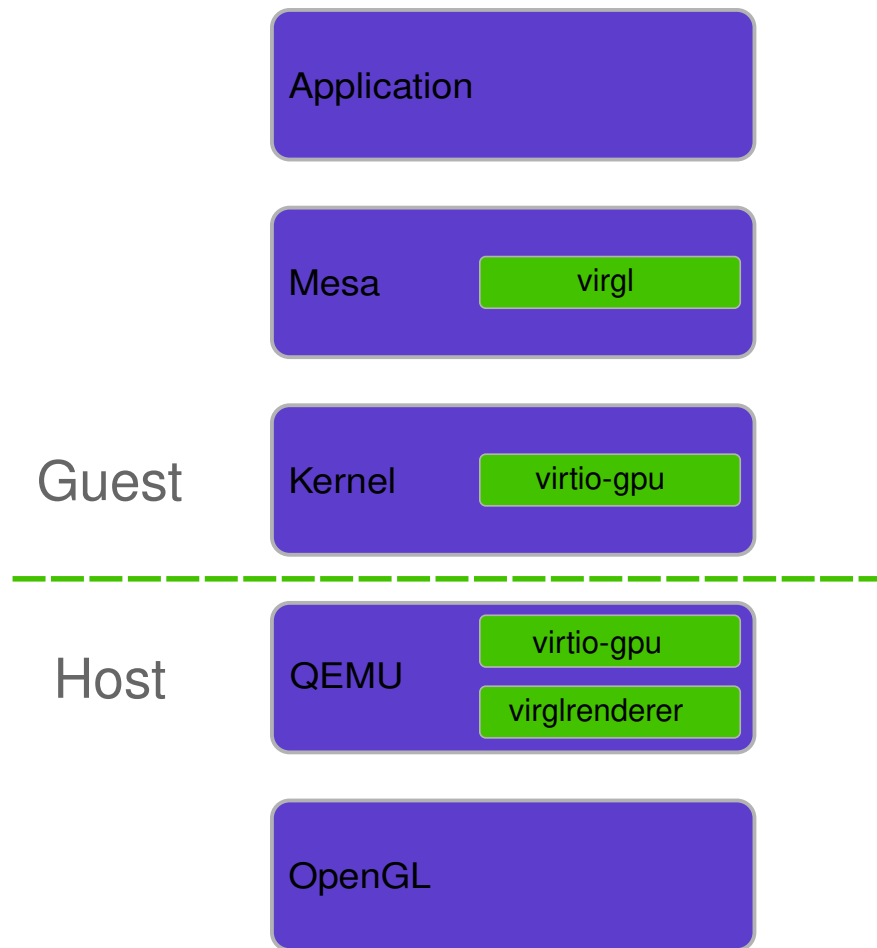
What is virgl?

History

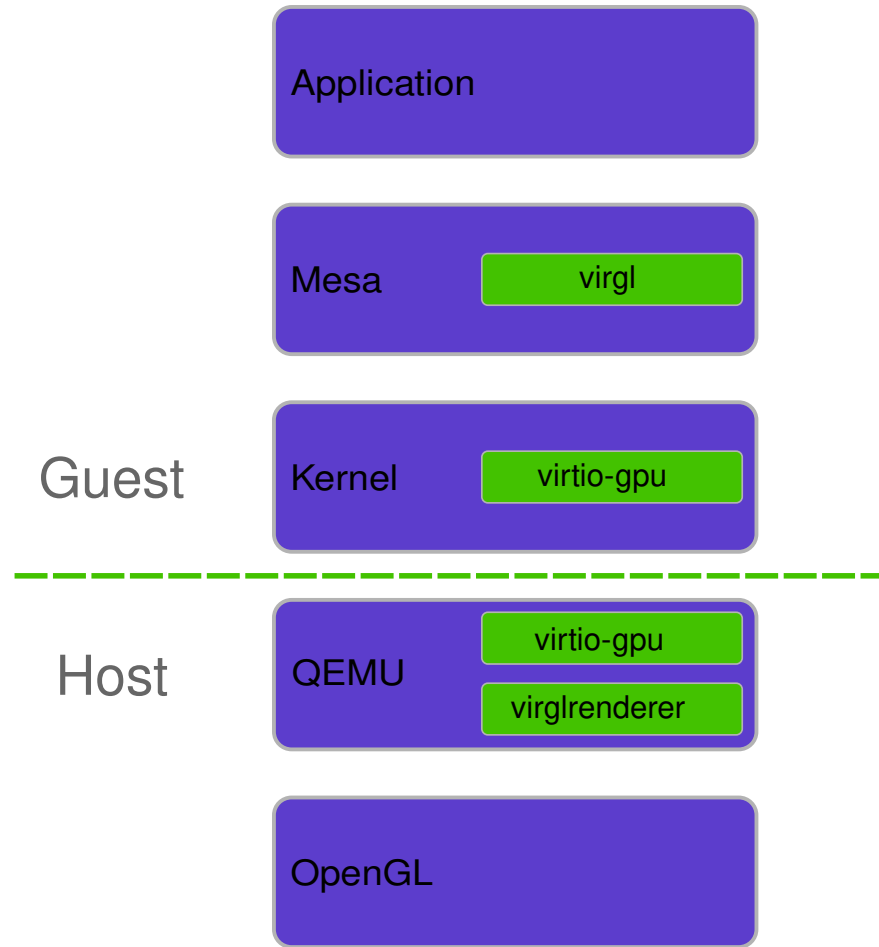
- Dave Airlie side project.
- Virtual 3D GPU for QEMU.
- Security in mind.
- Base on Gallium architecture.
- <https://www.youtube.com/watch?v=rPeMrmeLTig>



Stack



IRs



Memory allocation (simplify)

- Guest allocates and creates resource.
- QEMU or virglrenderer creates host resource.
- QEMU creates a iovec for the guest resource.

- Guest writes data to the resource.
- Guest request a transfer.
- QEMU or virglrenderer copy data from guest to host resource.
- Guest can use the resource.





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Virgl through the year.

Last year status

- OpenGL 3.0 support.
- OpenGL backend only.



Current status

- OpenGL 4.3 support.
- OpenGL ES 3.2 support.
- OpenGL and OpenGL ES backend.
 - Require SDL to create the GLES context.



Current status

- GLES2: NotSupported 25
- GLES3: NotSupported 162
- GLES32: NotSupported 1314



How did we achieve these results?

- Heavy use of host GPU features inside the guest
 - Caps initialized at launch
- Workaround for OpenGL ES
 - Modifying shader header.
 - GLES doesn't support glDrawBuffer.
- Add format support

Debugging

- Where the f*% is my issue?

Performance on Kabylake

Benchmark	Host	QEMU	Vtest
Unigine Heaven 1024x768 fullscreen Quality high 2x AA	27.9FPS (19.1 - 53.1)	14.6FPS 2.1FPS in September	18.4FPS (7.3 - 38.1)
Unigine Valley 1024x768 fullscreen Quality high 2x AA	24.6FPS (14.6 – 41.3)	13.9FPS 1.0FPS in September	16.4FPS (10.1 – 23.9)





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Infrastructure, GitLab and CI.

Infrastructure

- Still have some discussion over the ML.
- Eavy use of Freedesktop GitLab.
 - Pull requests.
 - Bug reports.
 - Wiki.
 - CI.



CI

- Merged few months ago.
- Use softpipe.
 - But llvmpipe and GPU are available
- Run the CTS.
 - Can run Piglit too.





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Plan for the future.

Future

- Increase the GL version.
- Improving GL on top of GLES.
- Performance.
 - Coherent memory.
 - Caching.



Future

- Vulkan support.
 - Started by Nathan Gauer, GSoC student.
 - <https://github.com/Keenuts/vulkan-virgl>



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Demo.

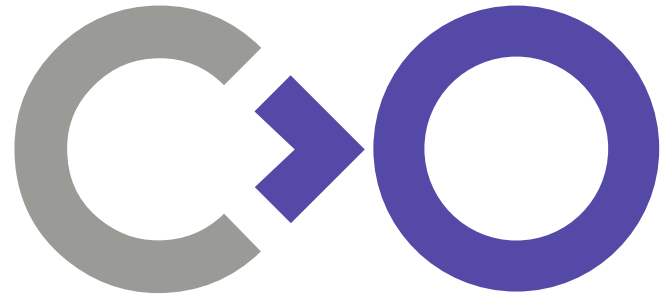
Join the party

- <https://gitlab.freedesktop.org/virgl/virglrenderer>
- #virgil3d on Freenode
- virglrenderer-devel@lists.freedesktop.org





Q&A and discussion.



We are hiring!



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Thank you!



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