

What's new in the virtual world?

XDC 2018

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Collabora



Summary

- What is virgl?
- Evolution of virgl through the year.
- The infrastructure, GitLab and CI.
- Plan for the future.
- Q&A and discussion.



What is virgl?

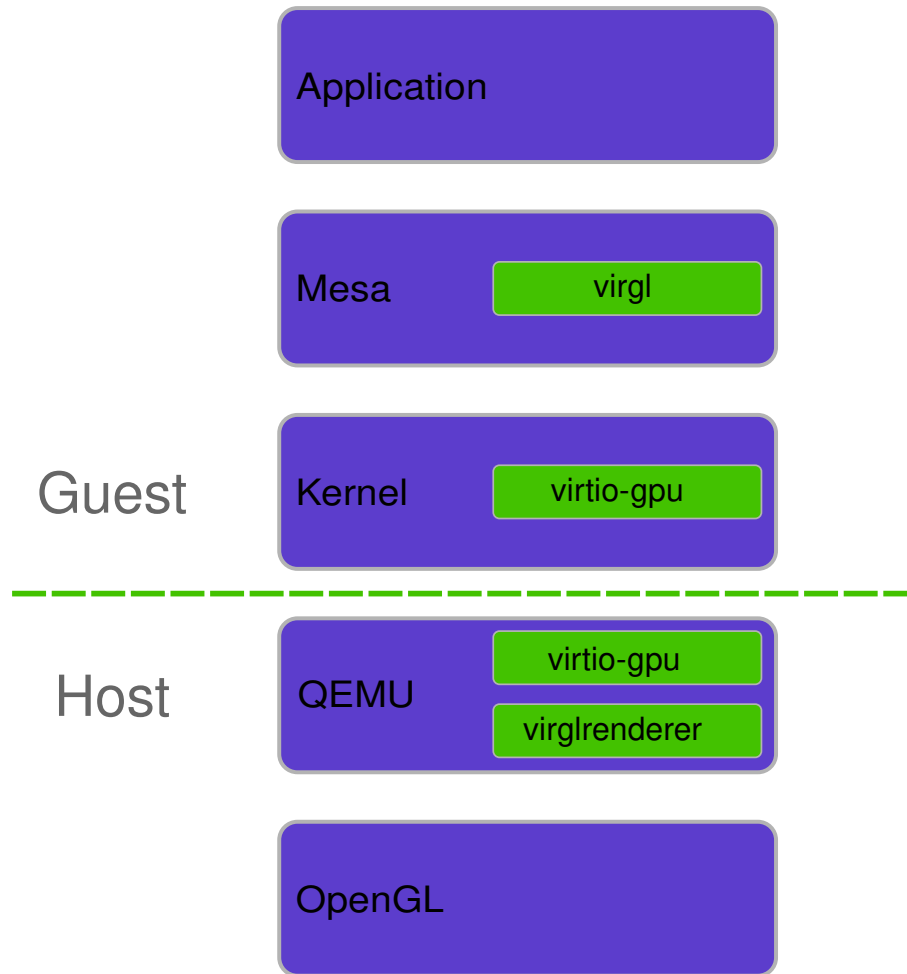
History

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

- Reach production level.

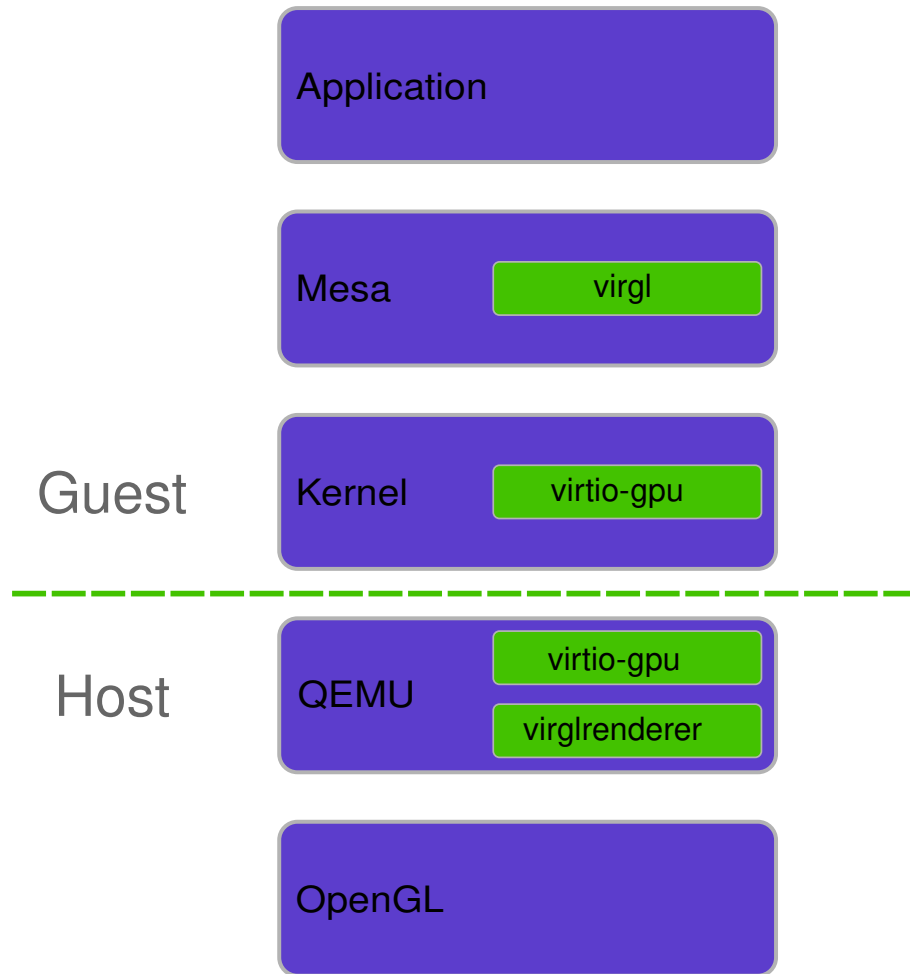


What is virgl? Stack





What is virgl? IR





What is virgl?

Resource allocation (part 1/2)

- Guest virtio-gpu driver allocates resource.
- Guest driver creates resources (RESOURCE_CREATE_*).
- QEMU or virglrenderer creates host resource.
- Guest sets up backing storage (RESOURCE_ATTACH_BACKING).
- QEMU creates a iovec for the guest resource.



What is virgl?

Resource allocation (part 2/2)

- Guest writes data to resource.
- Guest requests a transfer (TRANSFER_TO_HOST_*).
- QEMU or virglrenderer copy data from guest resource to host resource
- Guest can use the resource. \o/

Project status at last XDC

- 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

- GLES 2 on GL and GLES: 0 failure.
- GLES 3 on GLES: 3 failures.
- GLES 3.2 on GL and GLES: 0 failure, 3397 not supported.
- State leaks when we randomized the CTS.



Current status

How did we achieve these results?

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

Debugging

- Where the f*&% is my issue?



Performance on Kabylake

Benchmark	Host	QEMU guest	Vtest guest
Unigine Valley (1024x768, Q:High, AA:2x)	31.4 fps (17.9, 47.9)	1.0 fps (1.0, 1.5)	12.3 fps (8.4, 17.5)
Unigine Heaven (1024x768, Q:High, Tess: Normal, AA:2x)	37.3 fps (8.3, 64.1)	2.1 fps (1.5, 3.9)	13.4 fps (5.8, 24.9)
Gputest Pixmark Piano Windowed: 1024x640	7 fps	6 fps	6 fps

<https://lists.freedesktop.org/archives/virglrenderer-devel/2018-September/001589.html>

The infrastructure

- Easy use of Freedesktop GitLab.
 - Pull request.
 - Bug report.
- Still have some discussions over the ML.



The infrastructure

- CI in progress
 - https://gitlab.freedesktop.org/virgl/virglrenderer/merge_requests/13



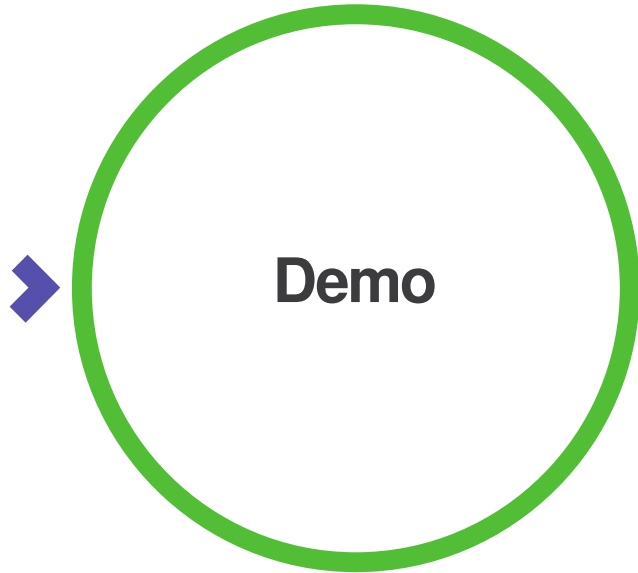
Plans for the future

- Release and improve the CI.
- Fix the remaining Piglit/CTS failures.
- Improve security of the project.
- Add coherent memory.



Plans for the future

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



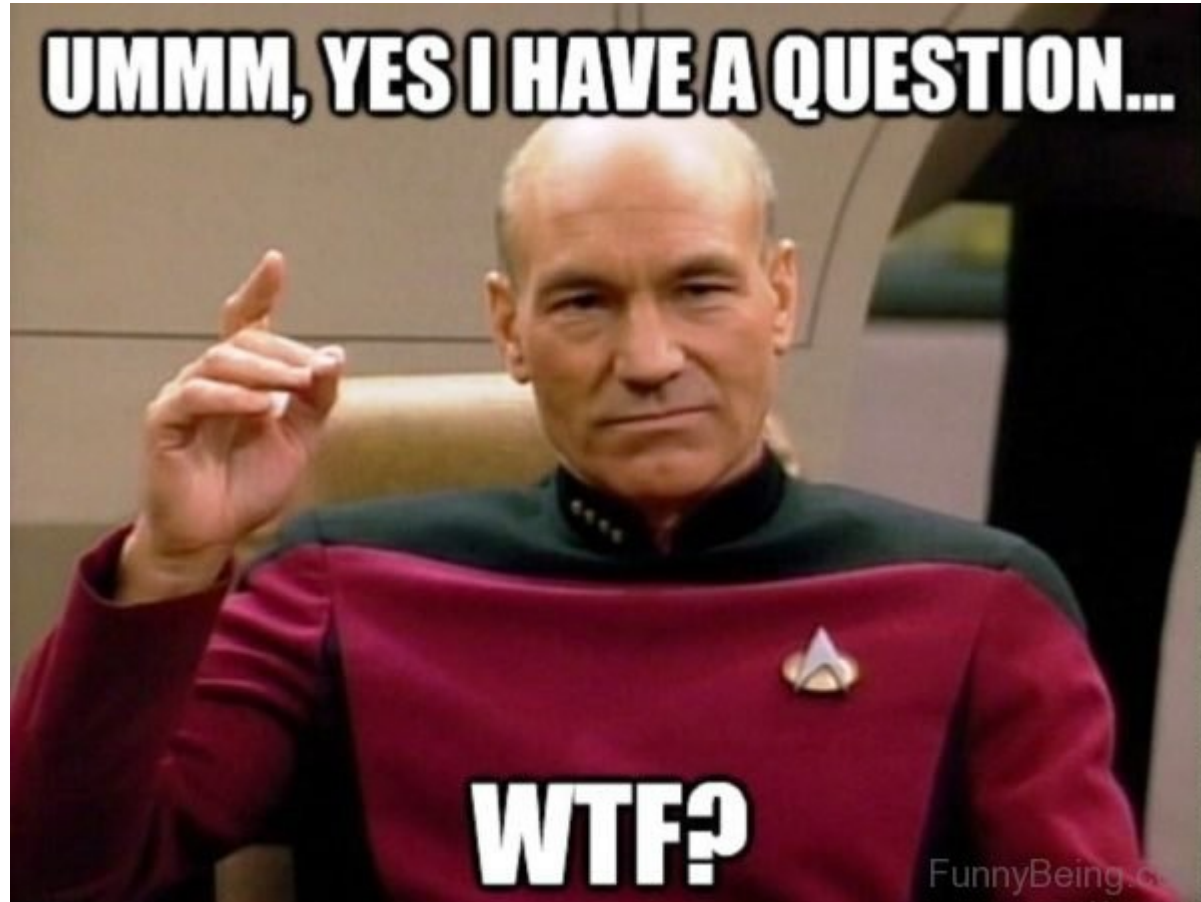
- What is a talk without a demo?



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

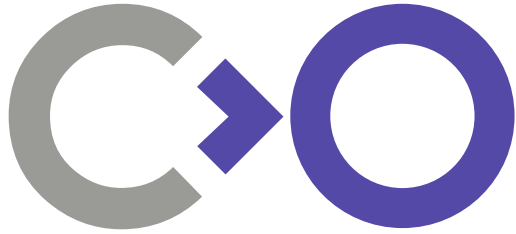


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Thank you!