The status of Turnip driver development

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What's Turnip

• The code name of Qualcomm Adreno GPU's open-source vulkan driver.
  - It is a reverse-engineered driver.
• Being actively developed on Mesa3D.
  - [https://gitlab.freedesktop.org/mesa/mesa](https://gitlab.freedesktop.org/mesa/mesa)
• Contributors: Igalia, Google, Mesa community.
Brief history before 2021

- Freedreno was created by Rob Clark around mid-2012.
  - Open-source OpenGL driver for Qualcomm Adreno GPUs.
- The vulkan driver development started in August 2018.
  - Turnip becomes a reality!
- Igalia started contributing to Turnip at the beginning of 2020.
What happened at 2021

- Turnip was dramatically improved by talented people.
  - Danylo Piliaiev, Connor Abbott, Jonathan Marek, Emma Anholt...
What happened at 2021

- Implemented lots of vulkan extensions.

- VK_KHR_spirv_1_4
- VK_EXT_descriptor_indexing
- VK_KHR_timelineSemaphore
- VK_EXT_subgroup_size_control
- VK_KHR_16bit_storage / VK_KHR_shader_float16_int
- VK_KHR_uniform_buffer_standard_layout
- VK_EXT_extended_dynamic_state / VK_EXT_extended_dynamic_state
- VK_KHR_pipeline_executable_propekkties
- VK_VALVE_mutable_descriptor_type
- VK_KHR_vulkan_memory_model
- ........
What happened at 2021

- Bug fixes for VK-GL-CTS and other test suites.
- Turnip was Vulkan 1.1 conformant for Adreno 618 GPUs!
What happened at 2021

- Make it run for windows games with dxvk/vkd3d on linux/arm
  - with x86 emulators (Fex, Box86)
  - Some window games started running!
What'll happen in 2022

- Focusing on real world use cases.
  - Still not enough games running on arm.
  - Trying to run more window games via wine(proton)
- Performance!
What'll happen in 2022

- A7xx is coming?
  - Interesting features like mesh shaders and ray tracing.
- Figure out pending unknown instructions
  - mostly for compute shaders
Thanks for listening