Status of the Embedded GPU Space
2018 Q1

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@memcpy_io
Agenda

- History
- Upstream Support
- What Comes Next
- The Big Picture
History
History
History
History
History
History
History
History
Upstream Support
Upstream Support

NVidia
Upstream Support

NVidia

Reverse Engineering
Upstream Support
NVidia

Reverse Engineering

Mesa
Upstream Support
Intel
Upstream Support

Intel

Mesa

2009
Gen6 Sandy Bridge
Gen7 Ivy Bridge
Gen9 Skylake
Gen8 Broadwell
Gen10 Cannonlake

2019
Upstream Support
AMD
Upstream Support
Broadcom

Mesa

2009 VC4 VC5 2019
Upstream Support
Broadcom VC4

Board: Raspberry Pi 3
SOC: Broadcom BCM2837
Upstream Support

Broadcom VC5

Board: ???
SOC: Broadcom BCM7268
Upstream Support
Qualcomm
Upstream Support
Qualcomm

Reverse Engineering
Upstream Support
Qualcomm

Reverse Engineering

Mesa
Upstream Support
Qualcomm
Upstream Support
Qualcomm Adreno A200

Board: iMX 53 Devkit
SOC: NXP iMX 53
Upstream Support

Qualcomm Adreno A300

Board: Dragonboard 410C
SOC: Qualcomm 410E
Upstream Support
Qualcomm Adreno A400

Board: Inforce 6540
SOC: Qualcomm 805
Upstream Support
Qualcomm Adreno A500

Board: Dragonboard 820C
SOC: Qualcomm 820E
Upstream Support
Vivante
Upstream Support
Vivante

Reverse Engineering
Upstream Support
Vivante

Reverse Engineering
- Initial commit GC2000
- GC3000
- GC7000
- 2019

Mesa
- 2009
- Driver introduced GC7000
- 2019
Upstream Support
Vivante GC2000

Board: iMX 6 Sabre
SOC: NXP iMX6q
Upstream Support
Vivante GC3000

Board: iMX 6 QP Sabre
SOC: NXP iMX6qp
Upstream Support
Vivante GC7000

Board: iMX 8 Devkit
SOC: NXP iMX8
Upstream Support

ARM
Upstream Support

ARM Mali Txxx

Board: Asus Tinkerboard
SOC: Rockchip RK3288
Upstream Support

ARM Mali Gxx

Board: HiKey 960
SOC: HiSilicon Kirin 960
Upstream Support
Imagination
Upstream Support
Imagination
What comes next
What Comes Next

- OpenGL improvements
What Comes Next

- OpenGL improvements
- OpenCL support
What Comes Next

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- OpenCL support
  - Intel OpenCL Neo
What Comes Next

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  - Intel OpenCL Neo
  - AMD ROCm
What Comes Next

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- OpenCL support
  - Intel OpenCL Neo
  - AMD ROCm
  - In progress: nouveau
What Comes Next

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- OpenCL support
  - Intel OpenCL Neo
  - AMD ROCm
  - In progress: nouveau
  - In progress: freedreno
What Comes Next

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What Comes Next

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- OpenCL support
- Vulkan support
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- OpenCL support
- Vulkan support
  - AMD RADV & AMDVLK
What Comes Next

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- OpenCL support
- Vulkan support
  - AMD RADV & AMDVLK
  - Intel ANV
What Comes Next

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- OpenCL support
- Vulkan support
The Big Picture
The Big Picture
Development
The Big Picture

Development

- Some drivers are very mature
The Big Picture

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• Non-supported drivers use more common code
The Big Picture

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- Reverse engineering to driver takes 0-3 years
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Vendors
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The Big Picture

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- Open Source drivers come in different shapes
The Big Picture

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  - Vendor supported or not
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  - NVidia
The Big Picture
Manufacturers
The Big Picture

Manufacturers

• Some industries need Open Source
The Big Picture

Some industries need Open Source

- Surprisingly the Aircraft industry
The Big Picture

Manufacturers

- Some industries need Open Source
  - Surprisingly the Aircraft industry
  - Anyone planning for >1year product support
Thank you!