GPU虚拟化在字节跳动的实践与展望

字节跳动系统部STE团队 刘琦

ByteDance 字节跳动

目录

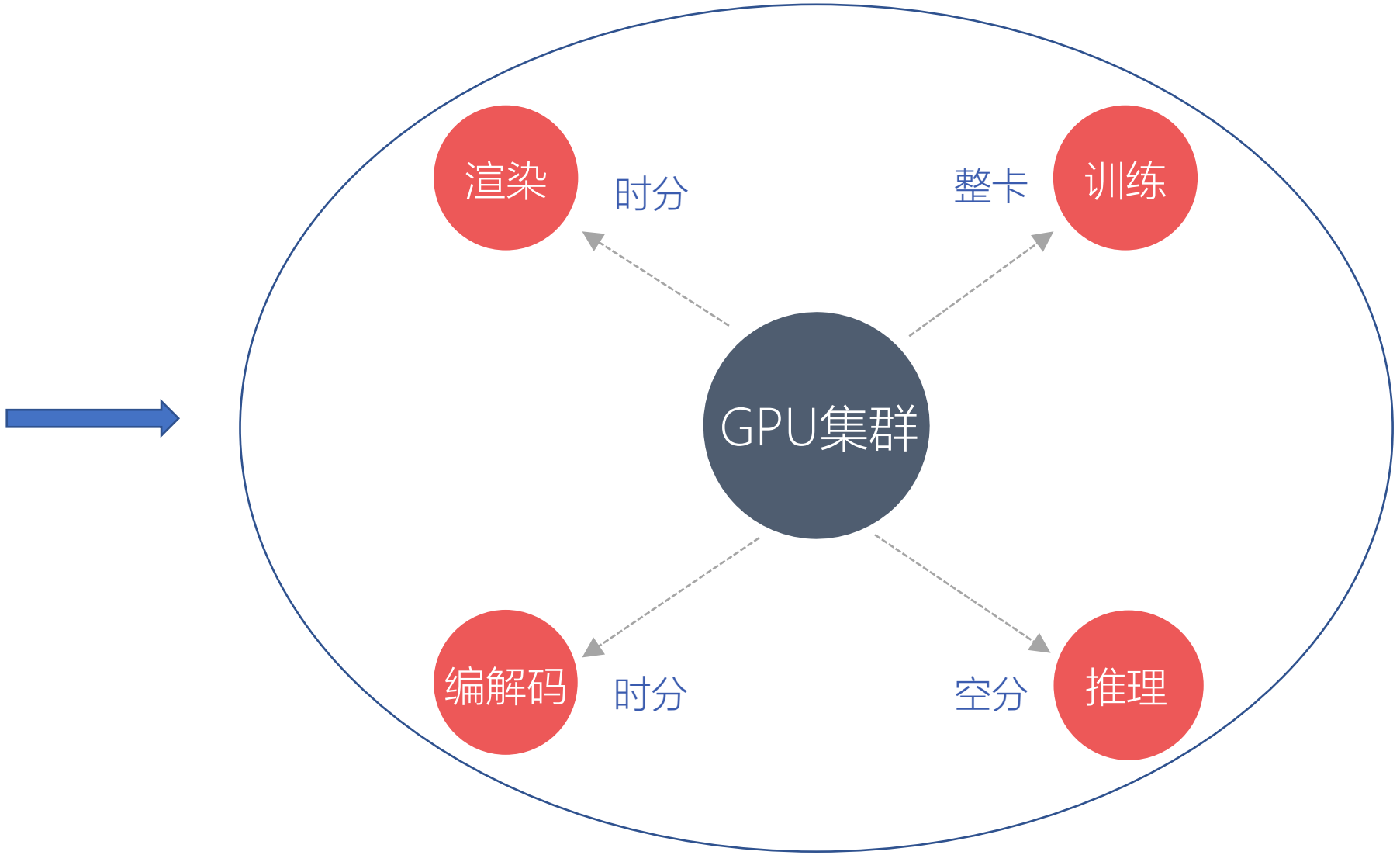
业务场景

动作捕捉

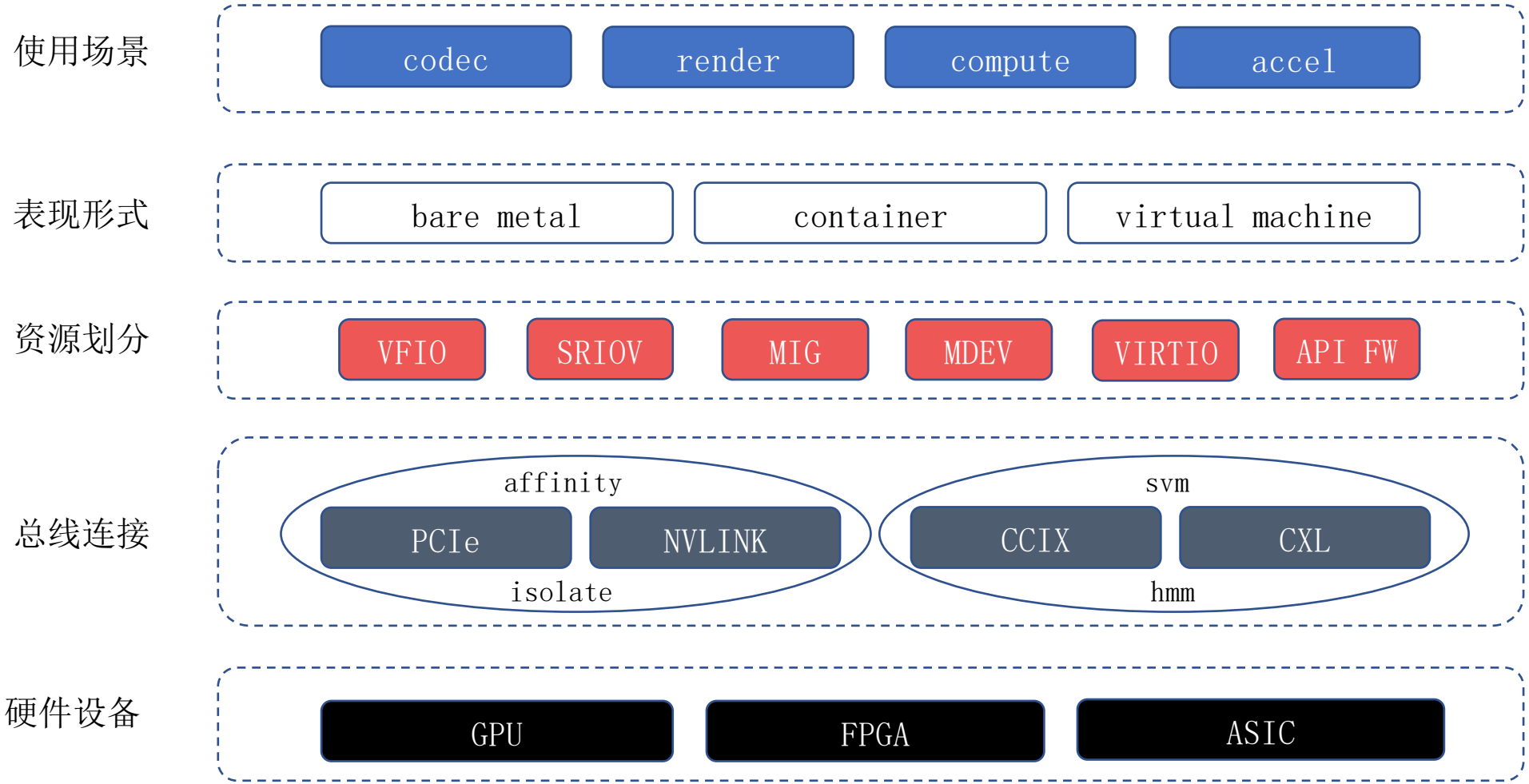
面部特效

虚拟现实

机器学习

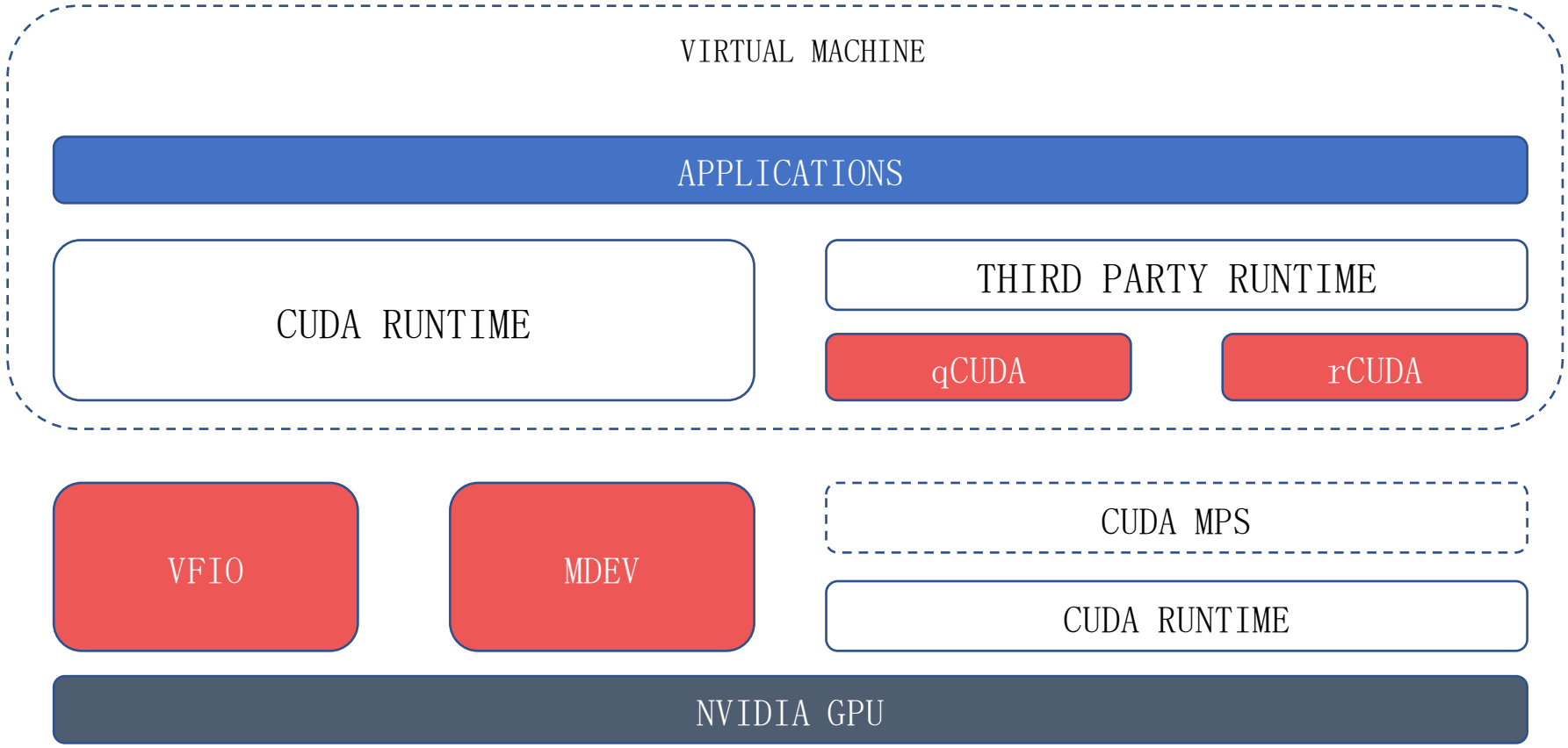


基础设施

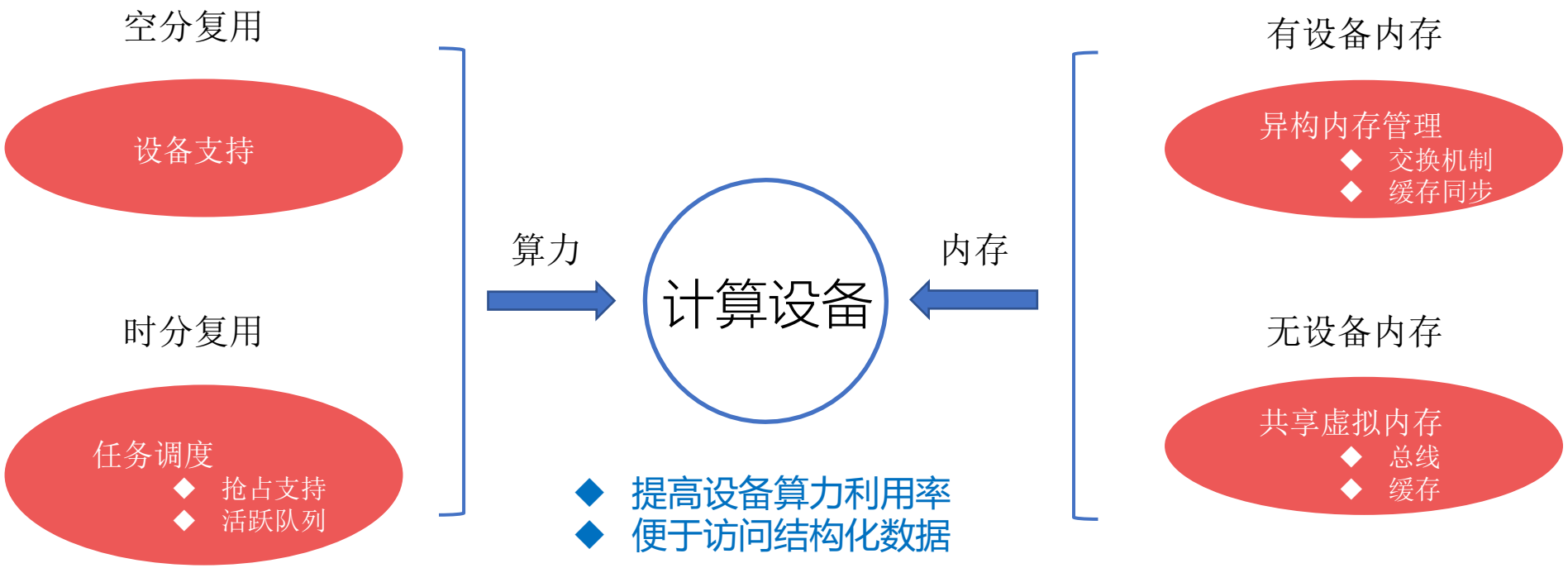


目录

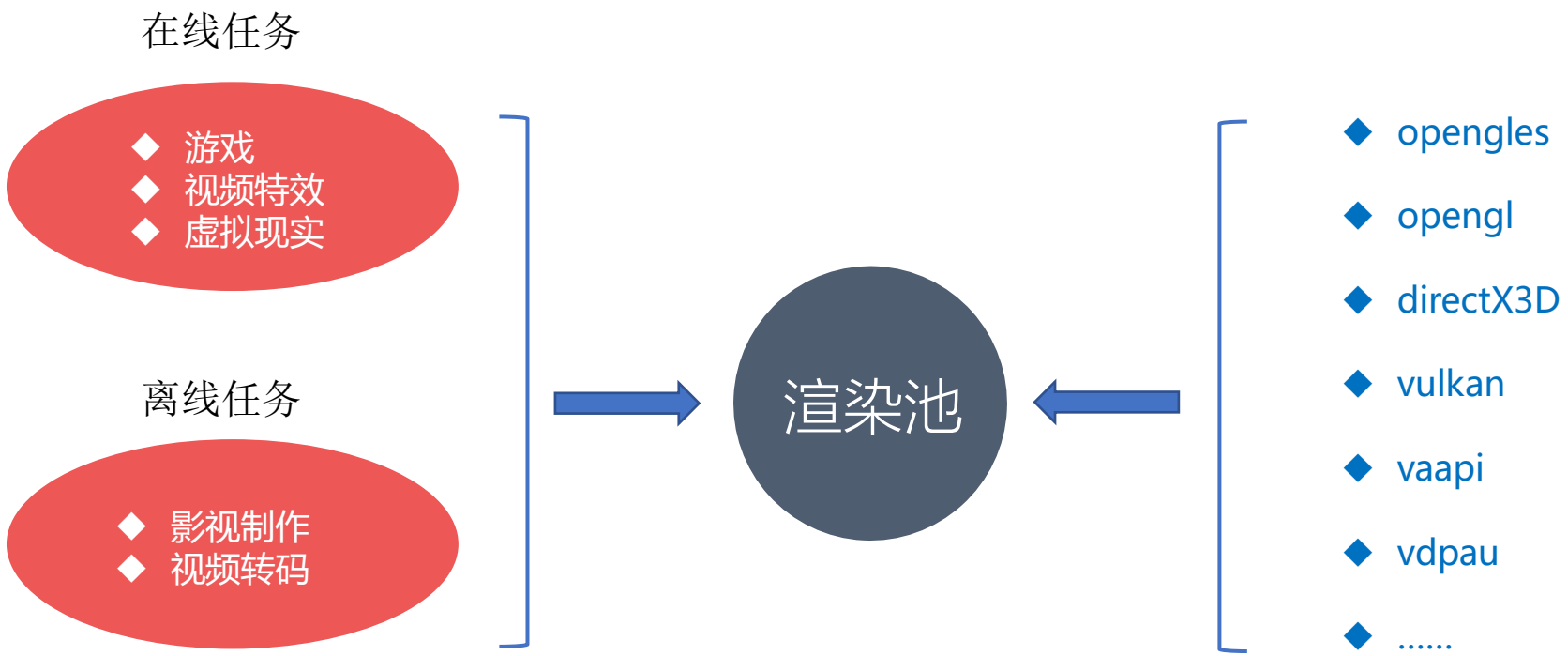
计算卡虚拟化



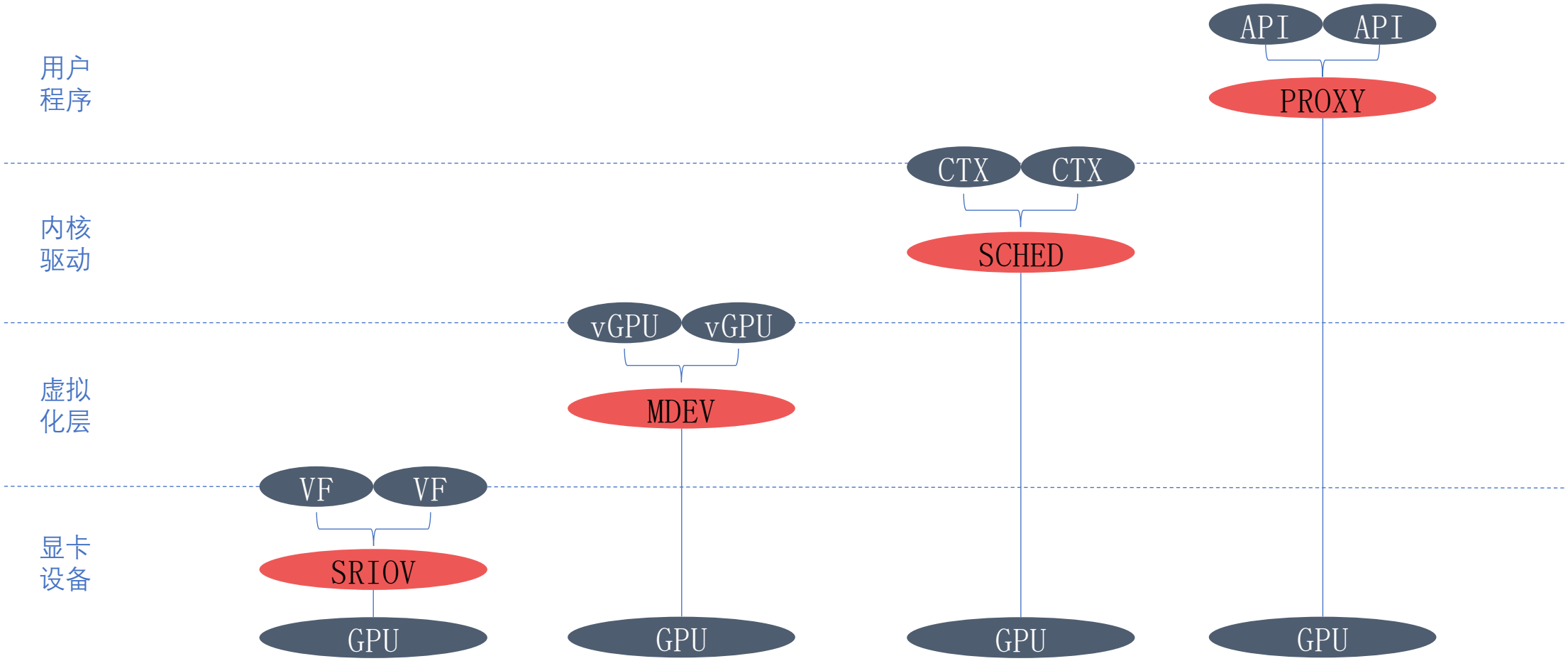
加速卡虚拟化



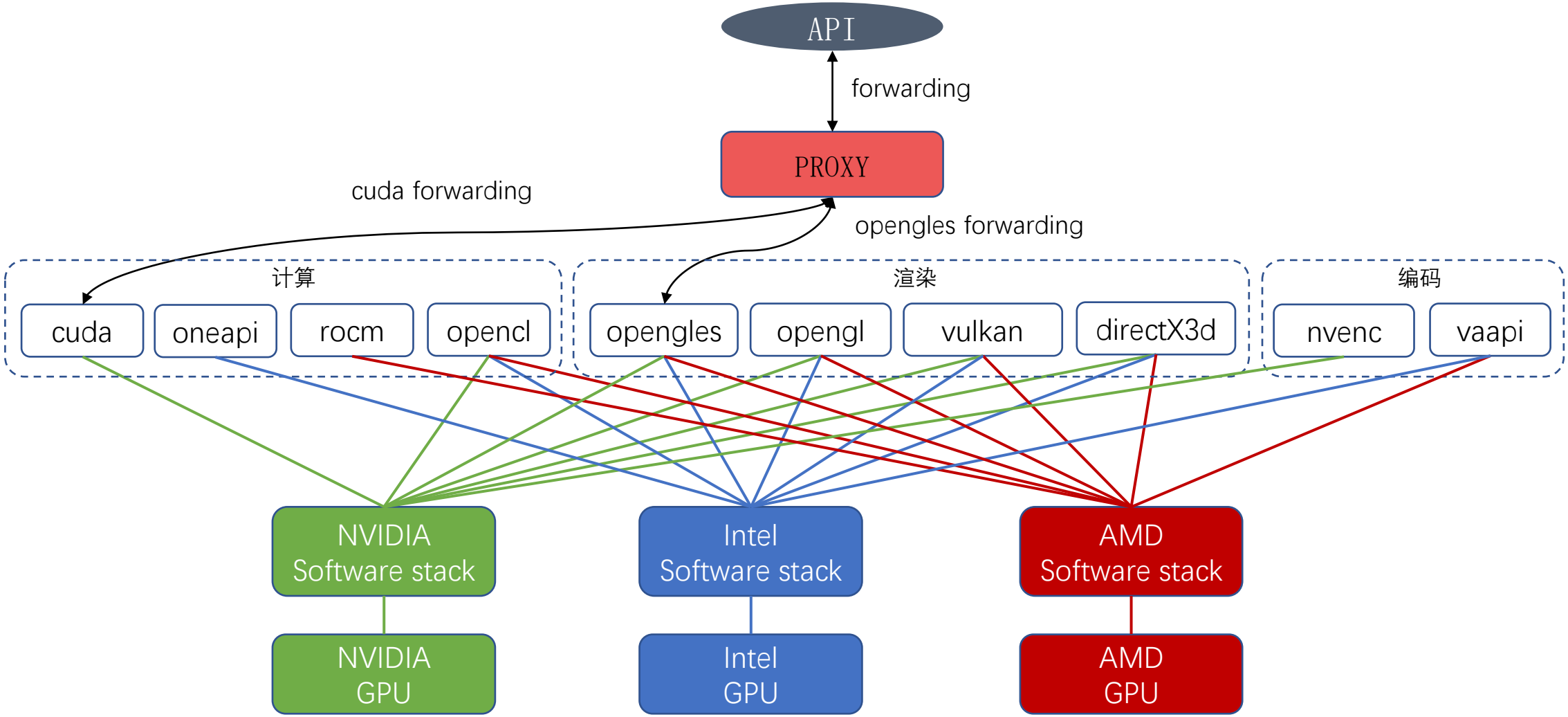
图形虚拟化场景



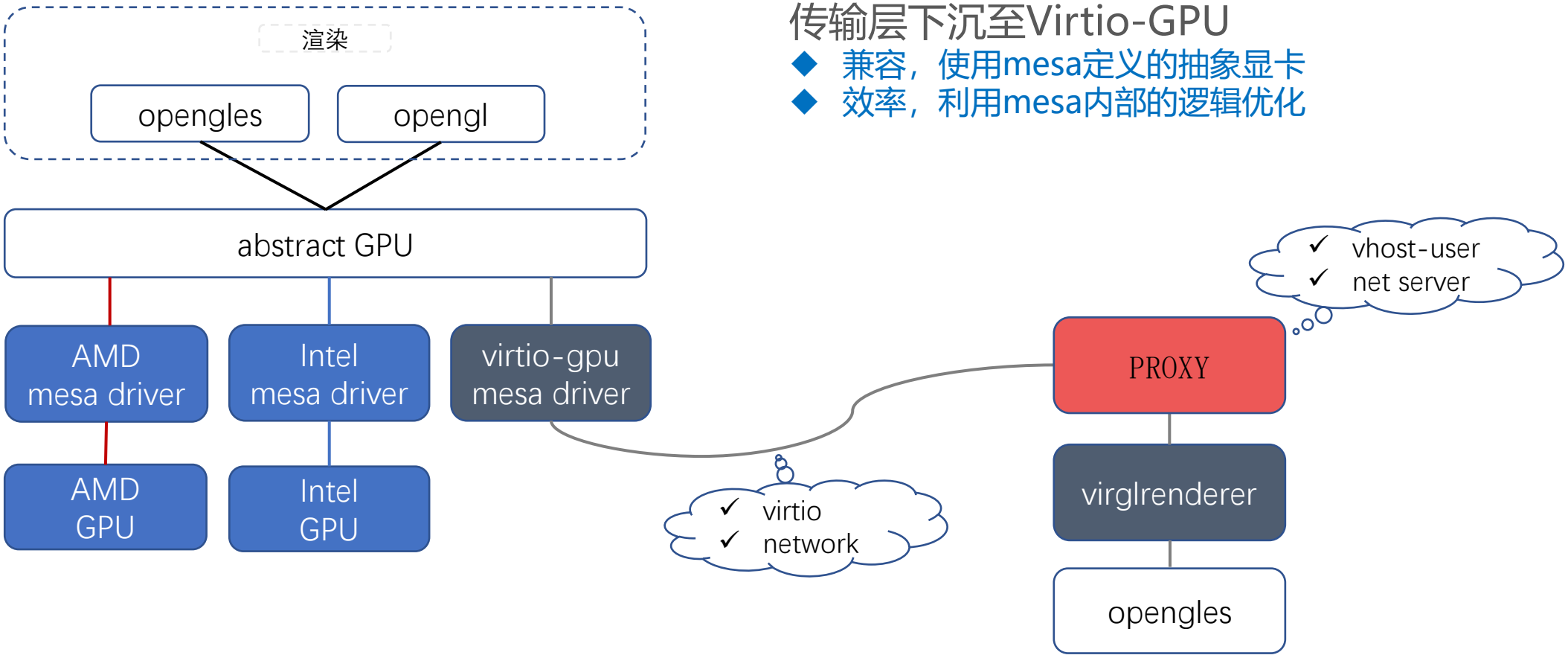
图形虚拟化方案



图形虚拟化方案 – API forwarding



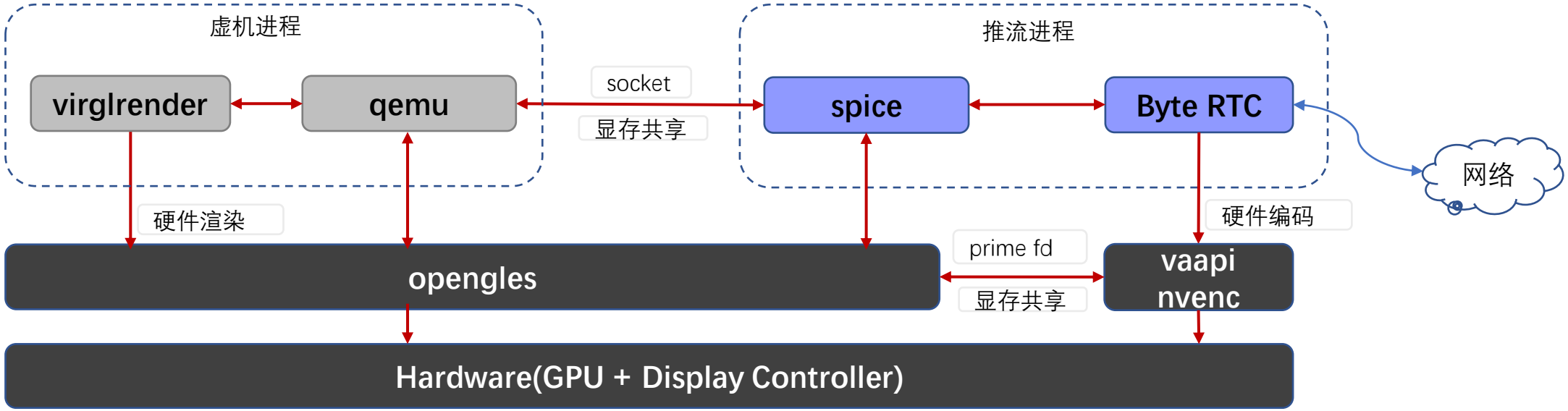
图形虚拟化方案 Virtio-GPU



传输层下沉至Virtio-GPU

- 兼容，使用mesa定义的抽象显卡
- 效率，利用mesa内部的逻辑优化

基于Virtio-GPU的实践

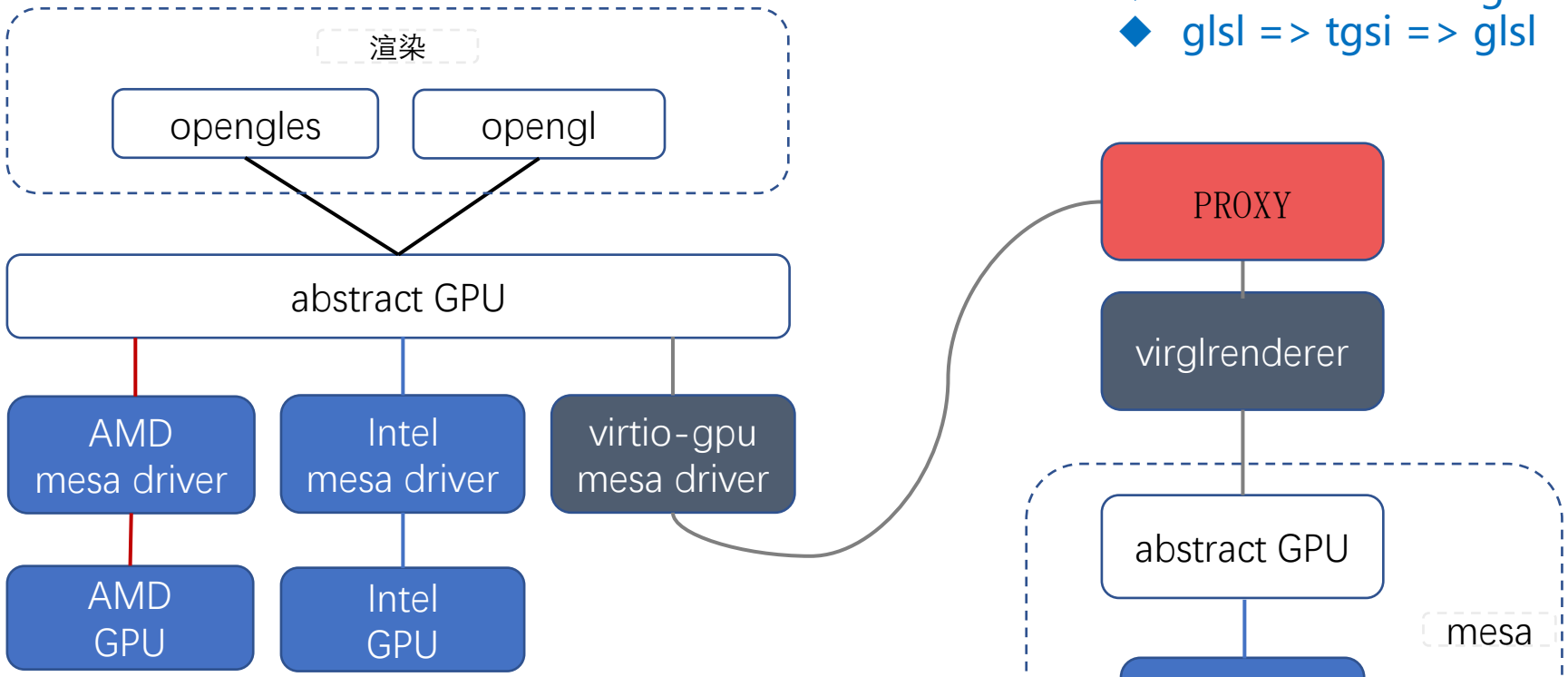


opengles3.0兼容测试结果:

```
04-29 08:19:10.931 12044 12076 I dEQP    : Test run totals:
04-29 08:19:10.931 12044 12076 I dEQP    :   Passed:        3524/3621 (97.3%)
04-29 08:19:10.931 12044 12076 I dEQP    :   Failed:        76/3621 (2.1%)
04-29 08:19:10.931 12044 12076 I dEQP    :   Not supported: 21/3621 (0.6%)
04-29 08:19:10.931 12044 12076 I dEQP    :   Warnings:      0/3621 (0.0%)
04-29 08:19:10.931 12044 12076 I dEQP    :   Waived:        0/3621 (0.0%)
04-29 08:19:10.931 12044 12076 I dEQP    : RenderThread::run(): render
```

目录

Virtio-GPU控制面



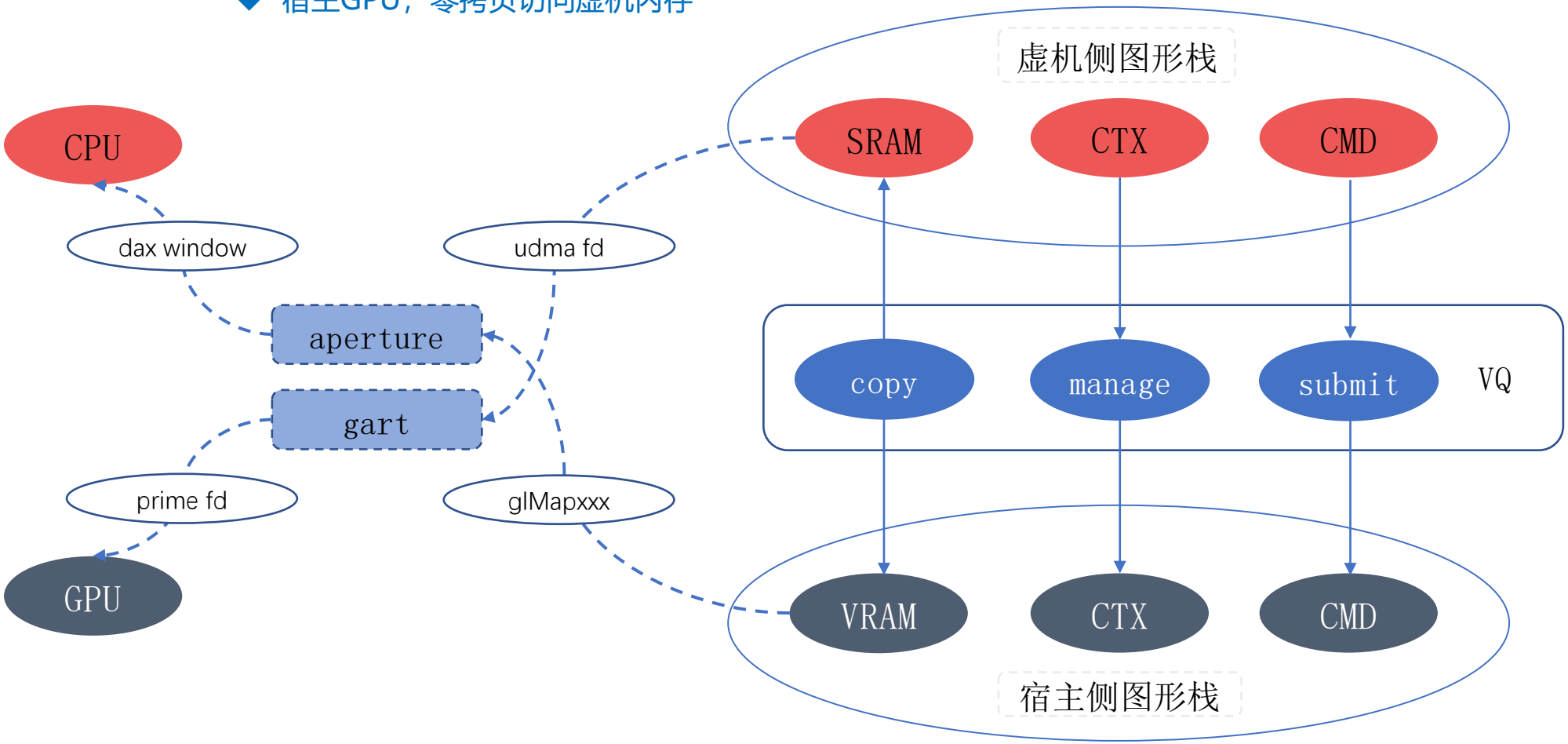
缩短控制面路径

- state tracker =>gallium => state tracker
- glsl => tgsi => glsl

Virtio-GPU数据面

减少数据面拷贝

- 虚机CPU，零拷贝访问宿主显存
- 宿主GPU，零拷贝访问虚机内存



THANKS.

ByteDance字节跳动