LiveVideoStackCon 音视频技术大会

北京 2019

遨游“视”界 做你所想
Explore World, Do What You Want

Flutter浪潮下的音视频研发探索

阿里巴巴闲鱼技术部　炉军

出品：LiveVideoStack 音视频技术社区 CSDN

LiveVideo StackCon 音视频技术大会 深圳 2019

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LiveVideoStackCon 2019 深圳

2019.12.13-14

出品: LiveVideoStack
音 视 频 技 术 社 区

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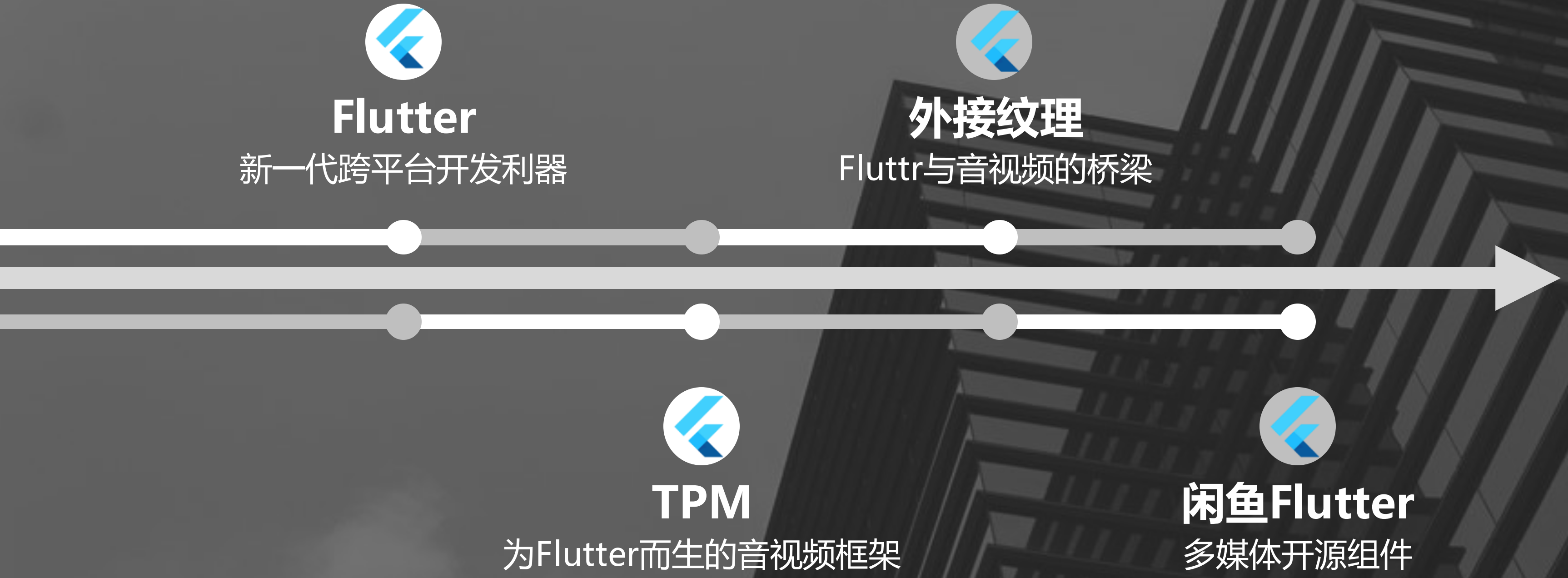
成为志愿者：volunteer@livevideostack.com

赞助、商务合作：kathy@livevideostack.com



Flutter

新一代跨平台开发利器

TPM

为Flutter而生的音视频框架

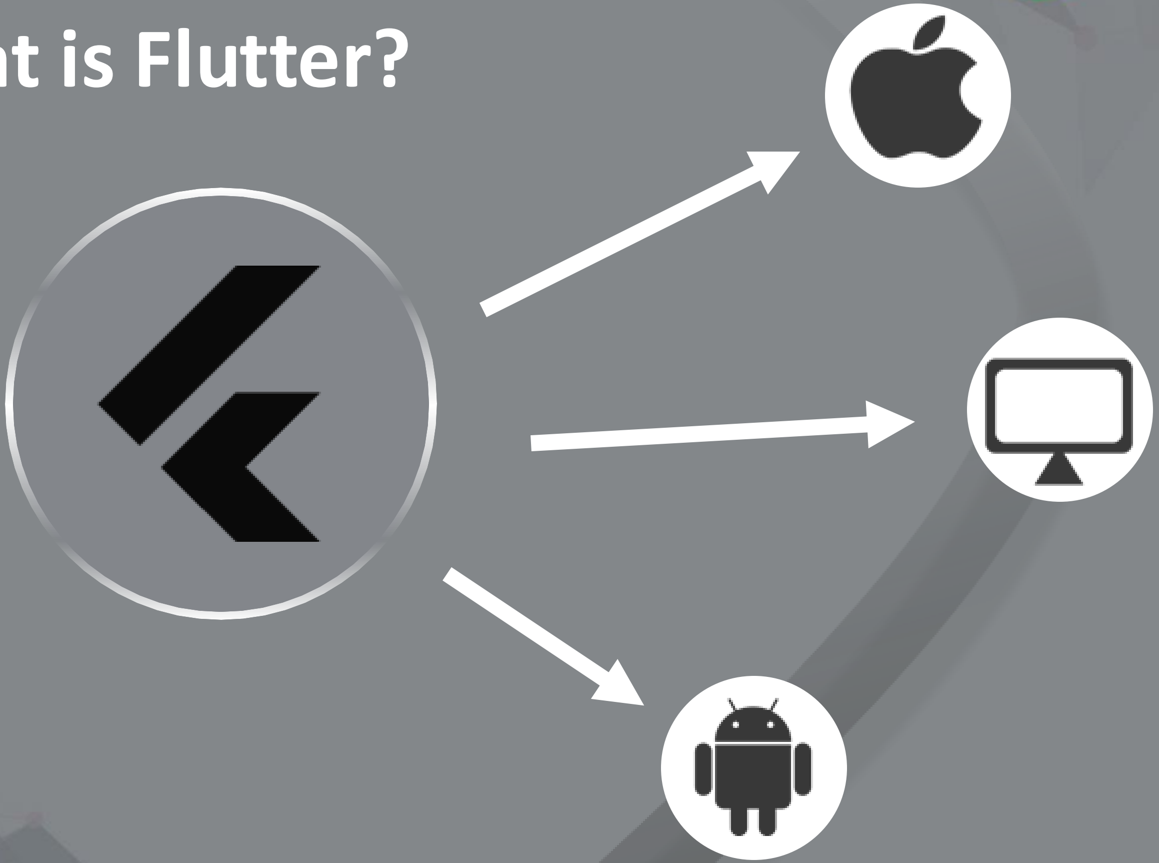
外接纹理

Fluttr与音视频的桥梁

闲鱼Flutter

多媒体开源组件

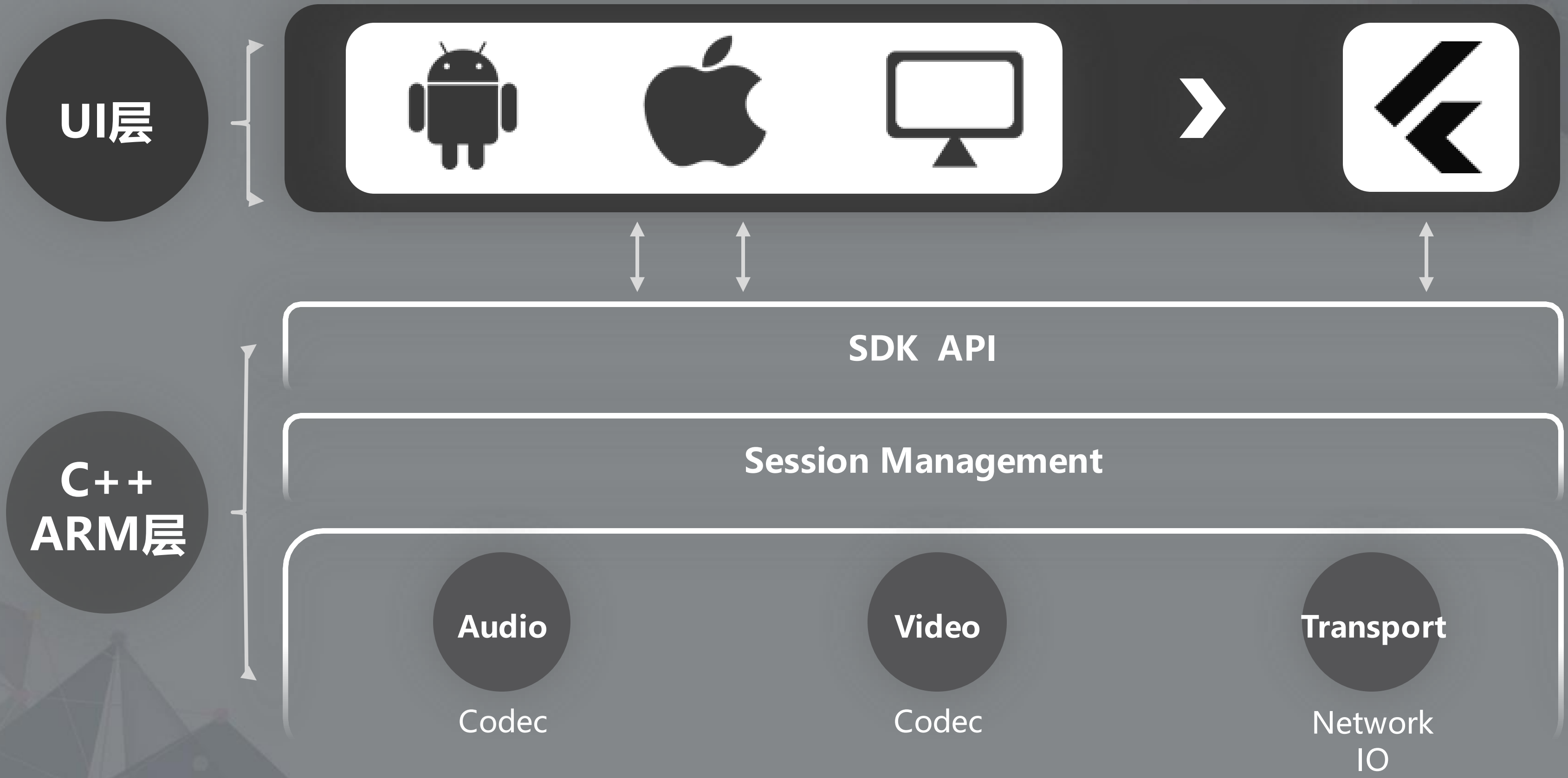
What is Flutter?



01

Flutter

新一代跨平台开发利器



UI层

C++
ARM层

SDK API

Session Management

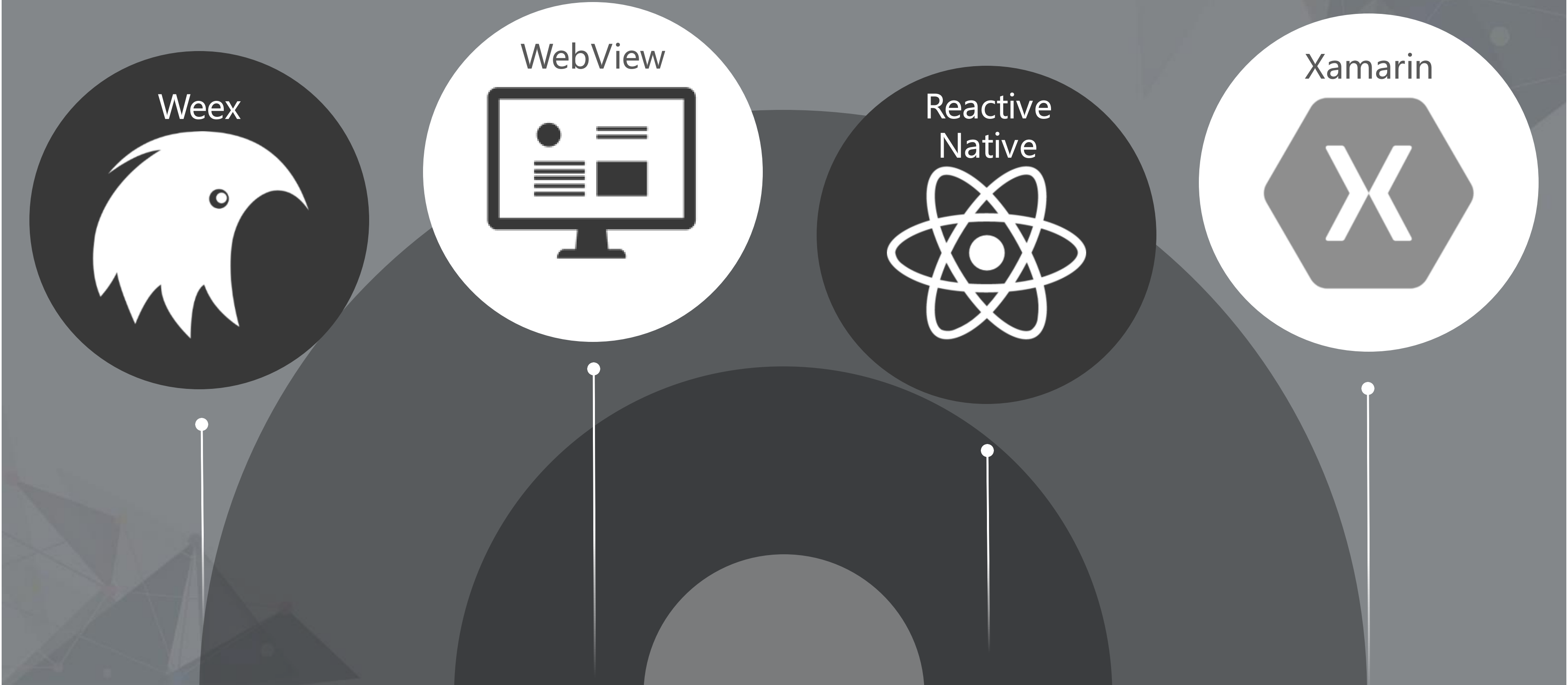
Audio
Codec

Video
Codec

Transport
Network
IO

01 Flutter

新一代跨平台开发利器



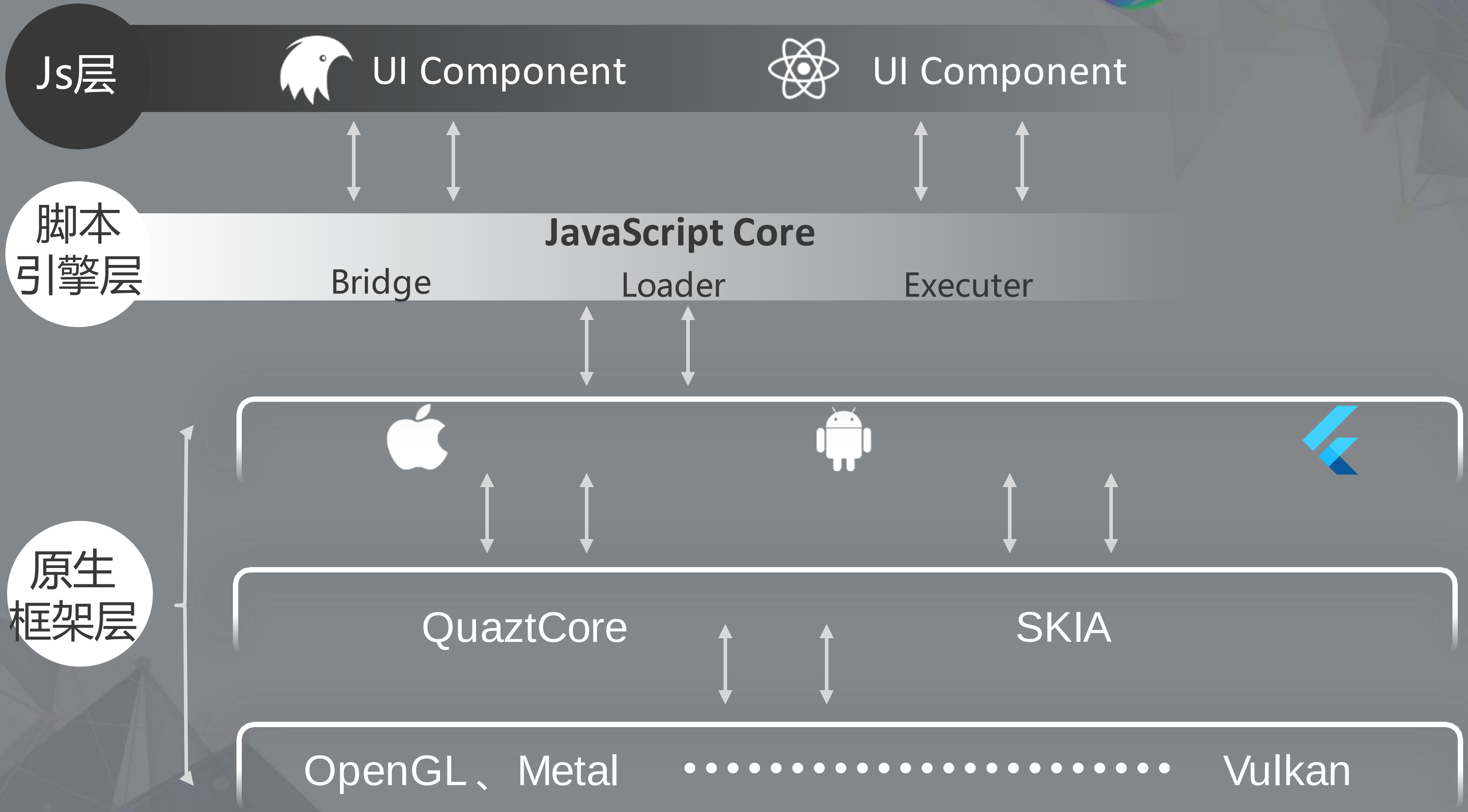
Weex

WebView

Reactive Native

Xamarin

Why Flutter?



Js层

UI Component

UI Component

脚本引擎层

JavaScript Core

Bridge

Loader

Executer

原生框架层

QuaztCore

SKIA

OpenGL、Metal ••••••••••••••••••••••• Vulkan

Flutter

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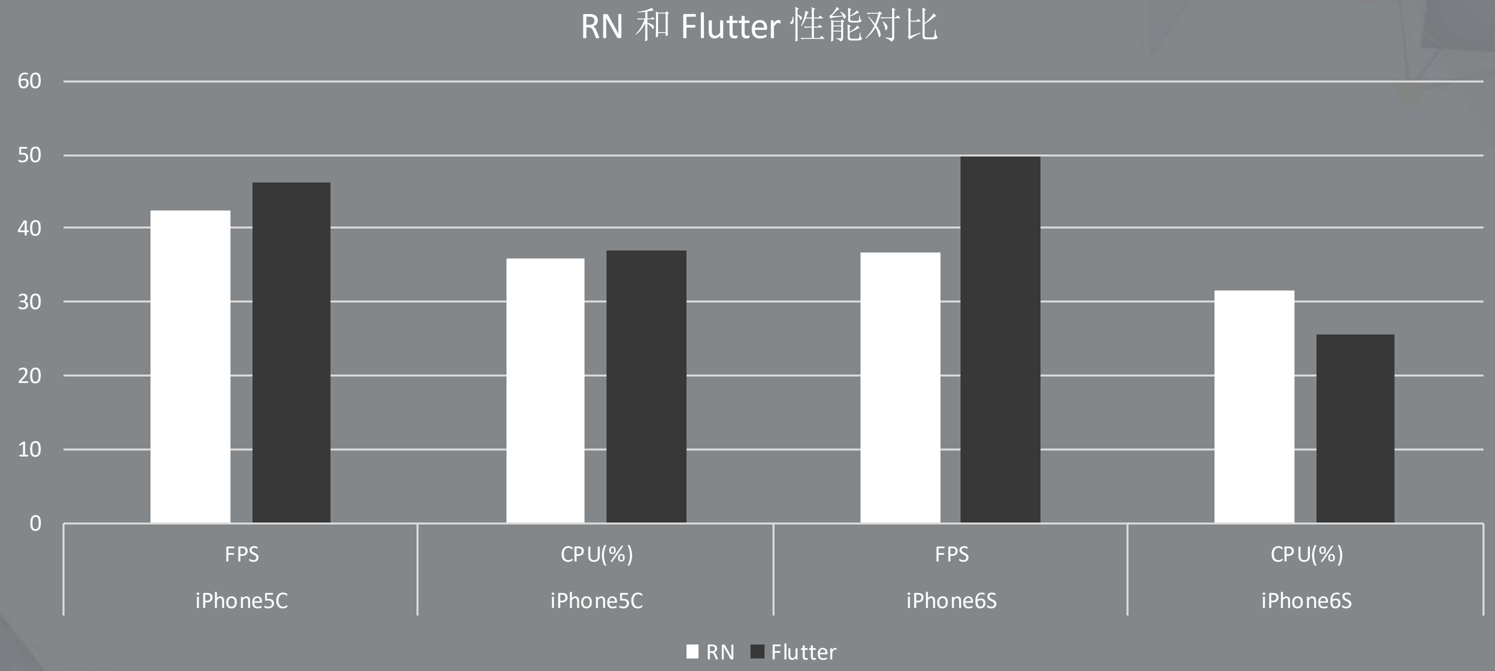
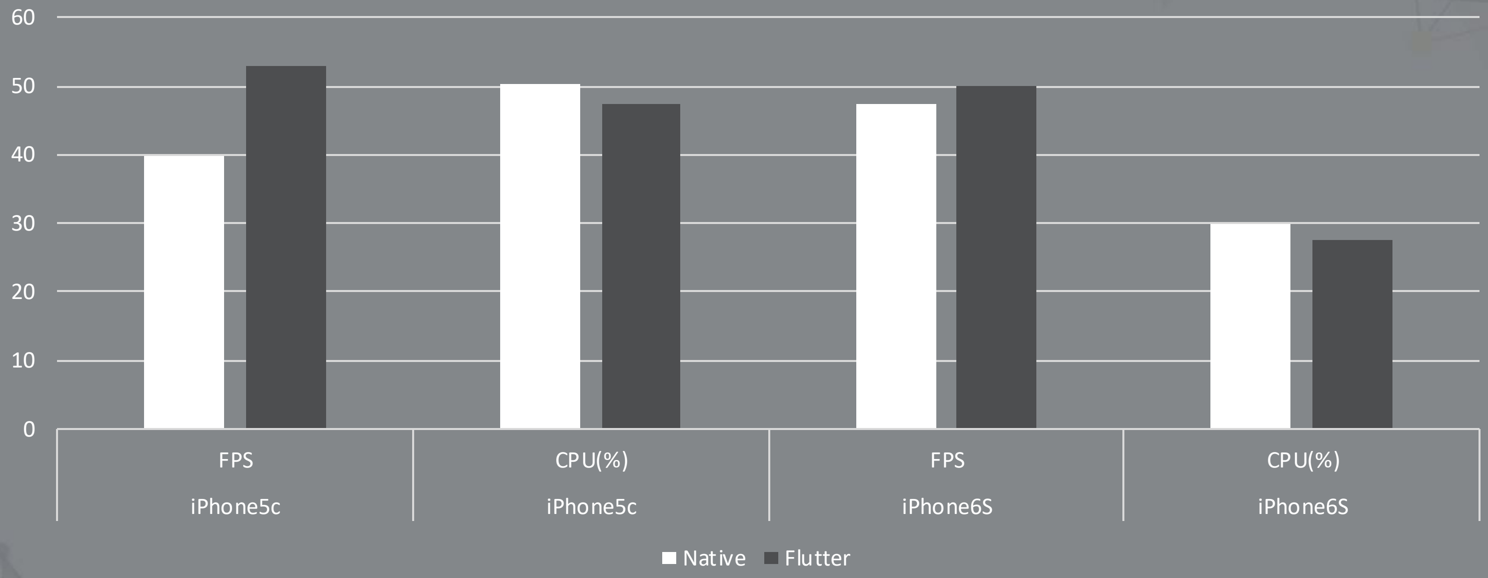


01 Flutter

新一代跨平台开发利器

Flutter 与 RN 性能对比



challenge

混合栈

音视频

solution

FlutterBoost

TPM

02 外接纹理

Flutter与视频的桥梁

外接纹理

Flutter

Frame

02

外接纹理

Flutter与视频的桥梁

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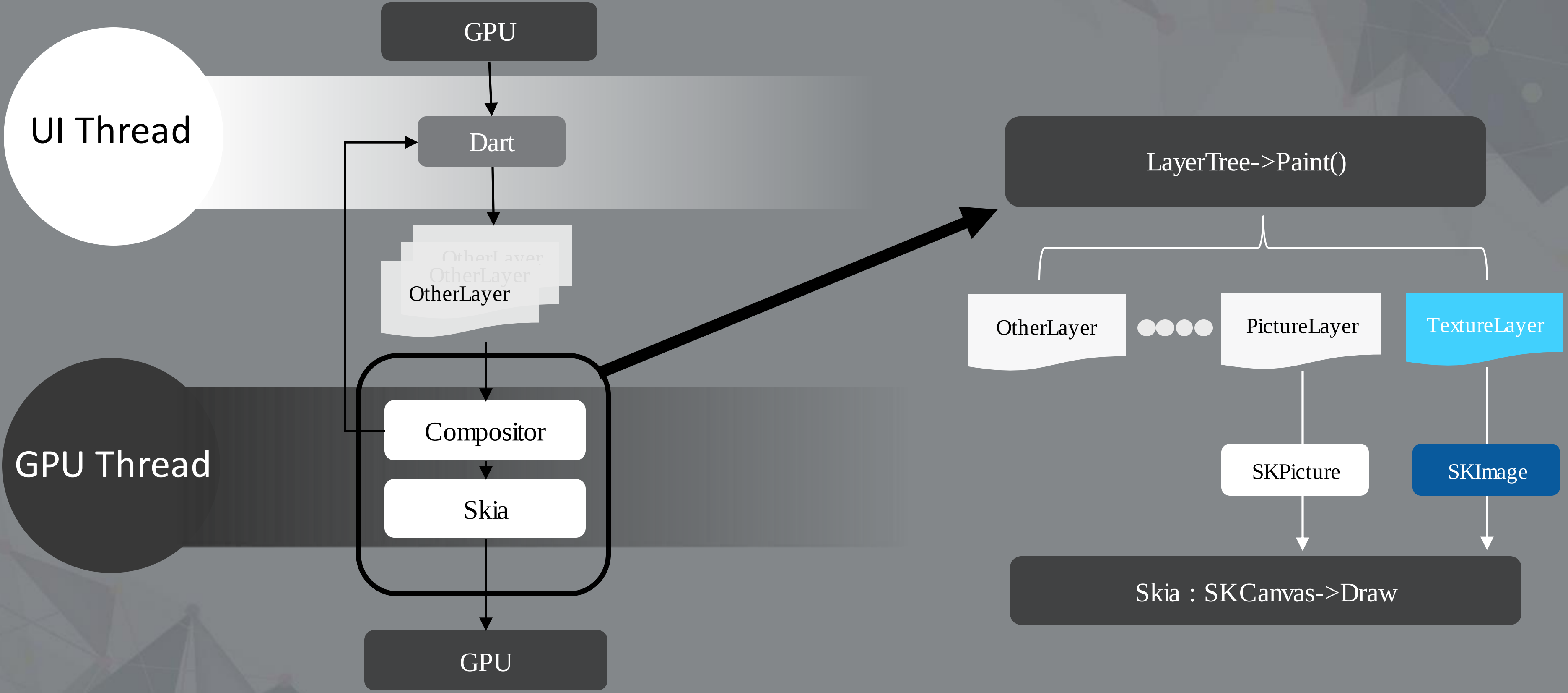
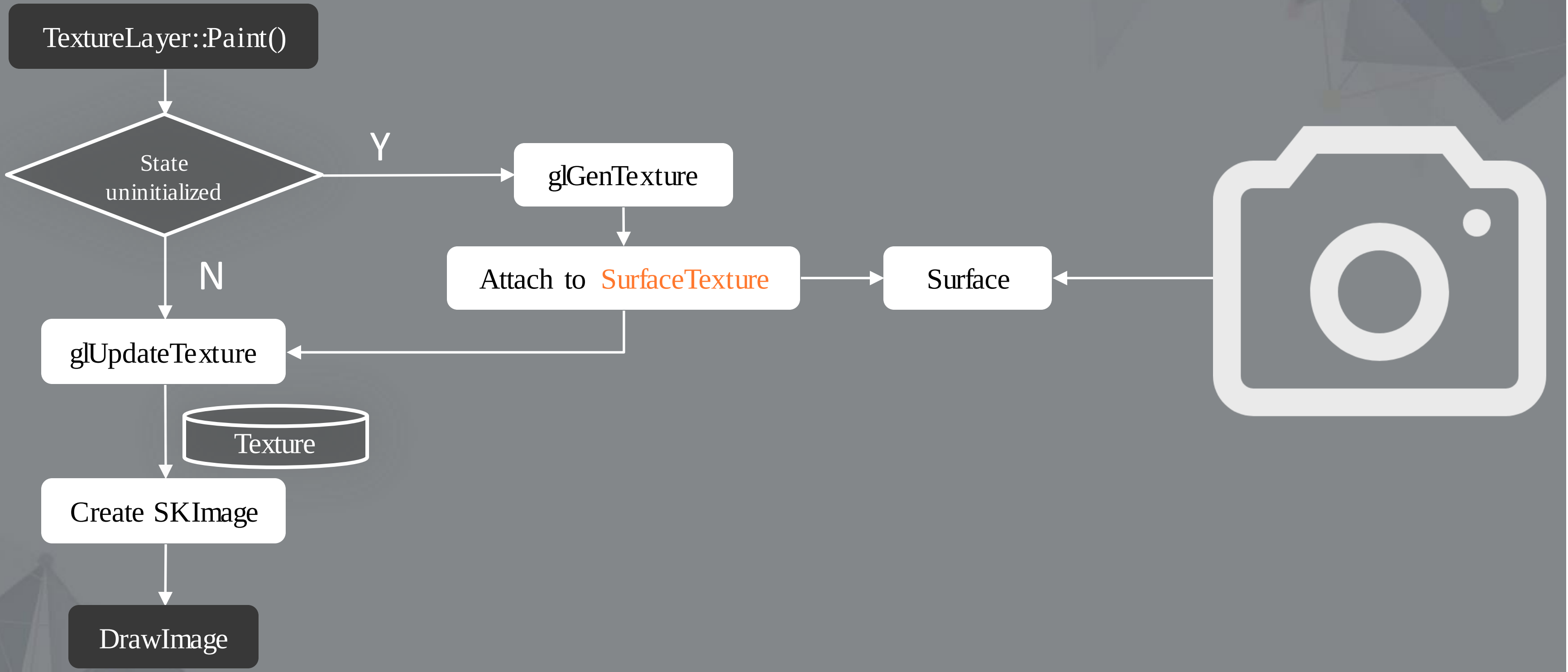


02

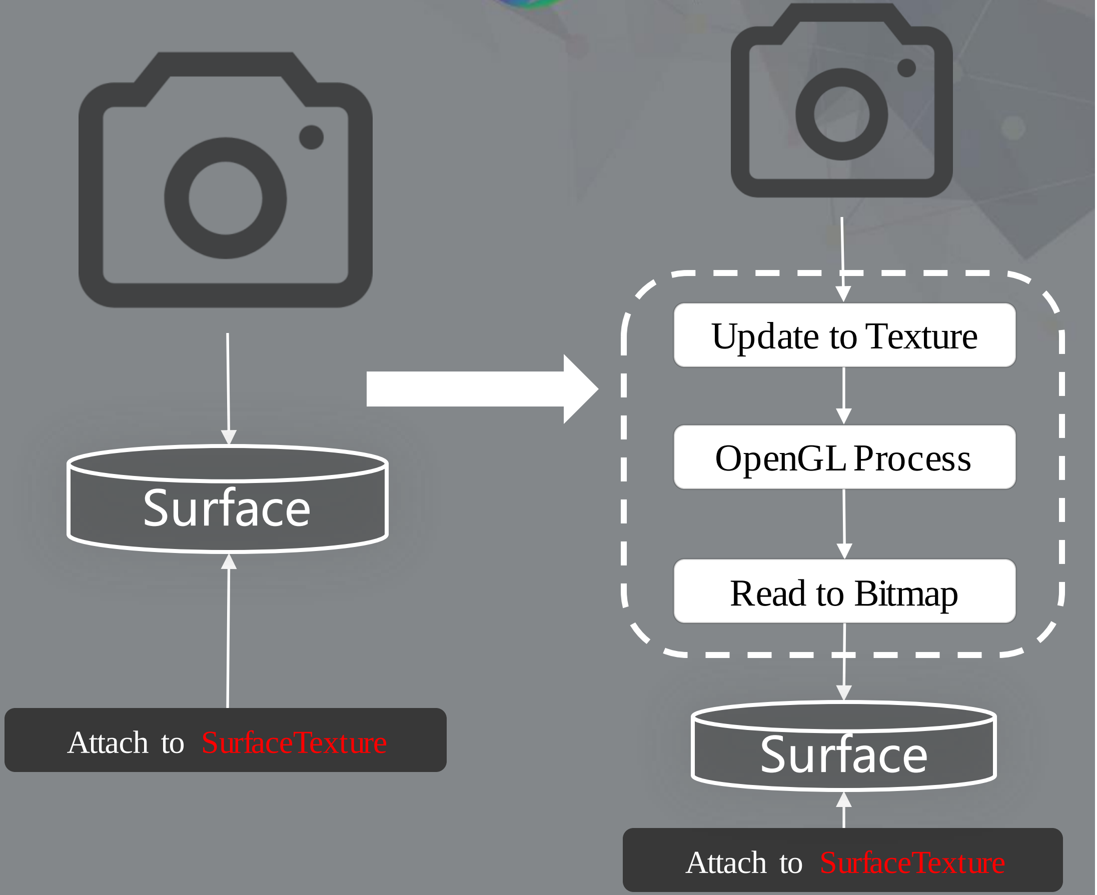
外接纹理

Flutter与视频的桥梁



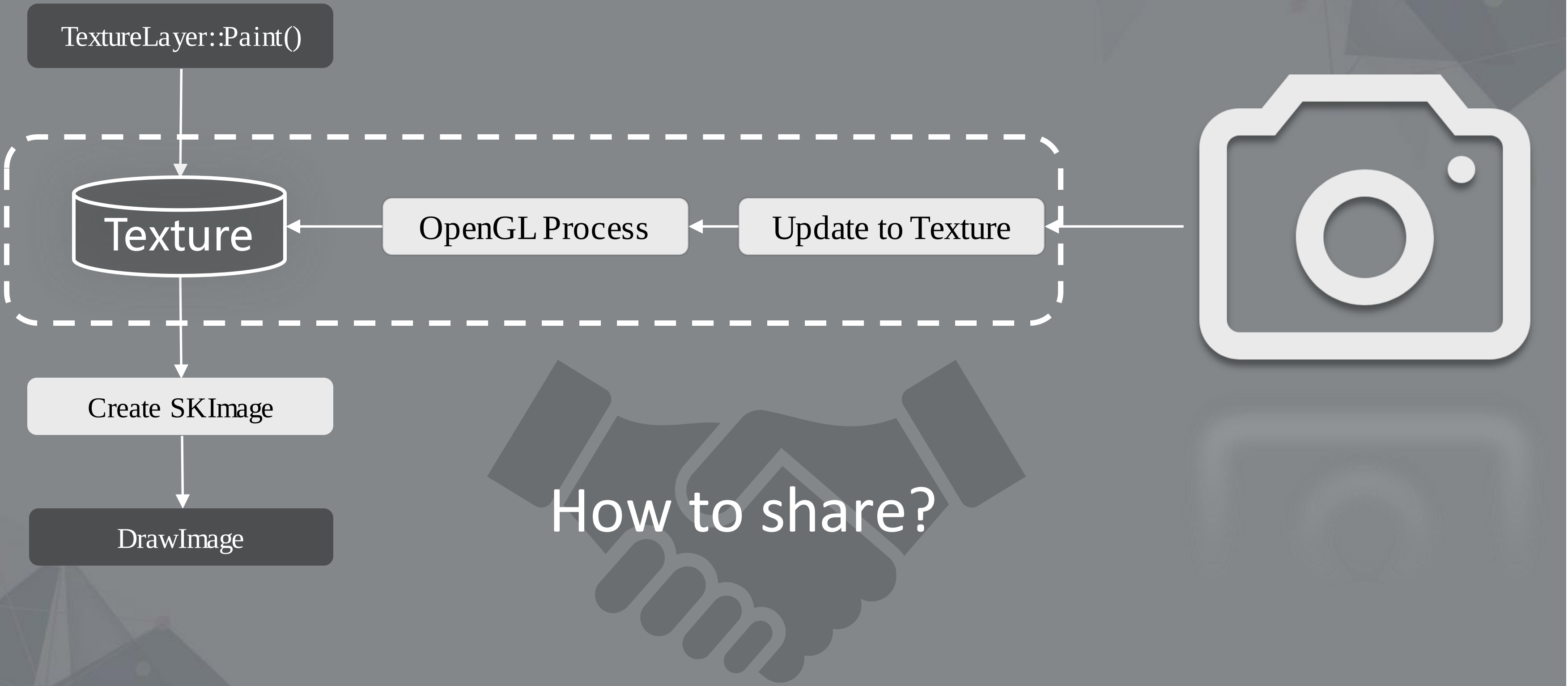
02 外接纹理

Flutter与视频的桥梁



外接纹理

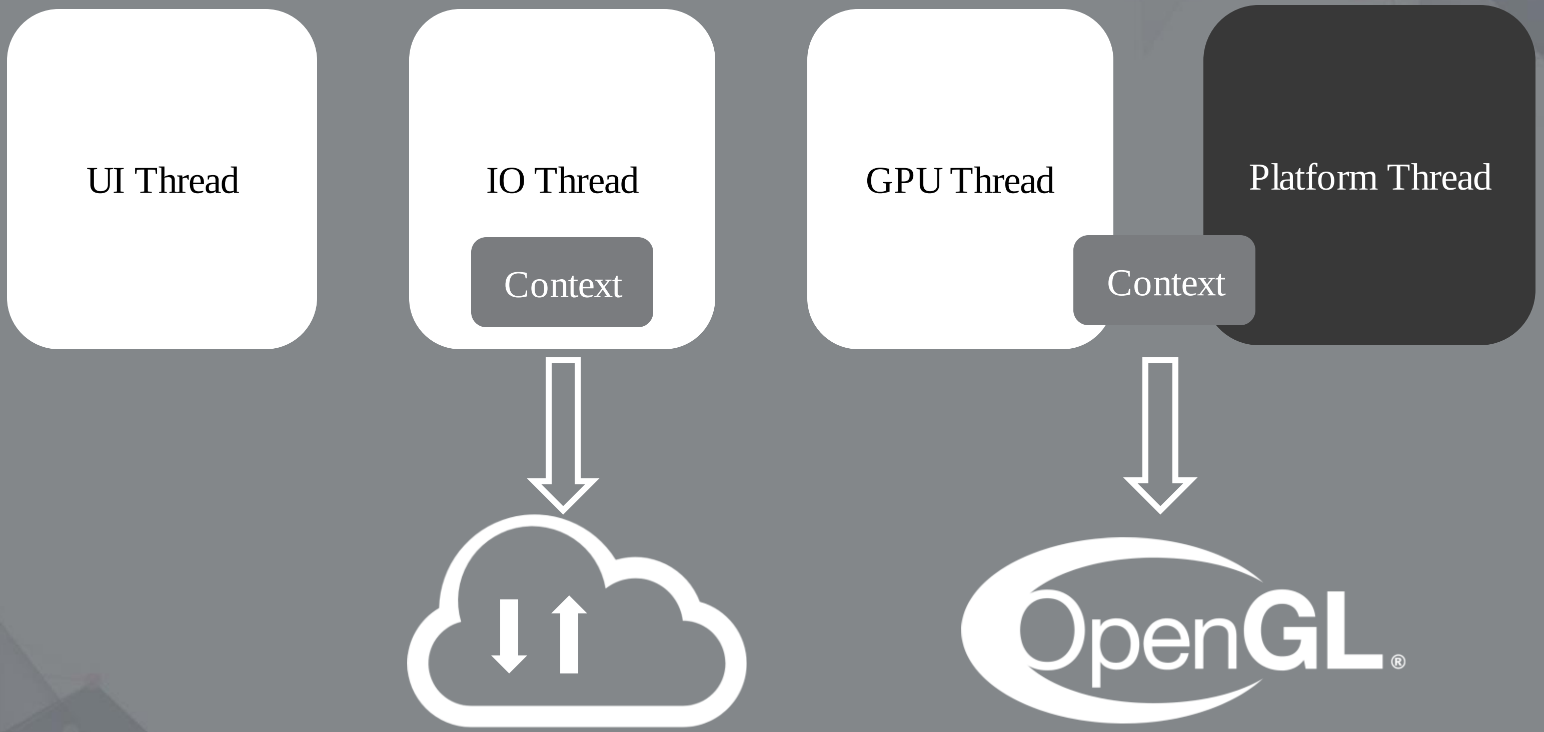
Flutter与视频的桥梁



How to share?

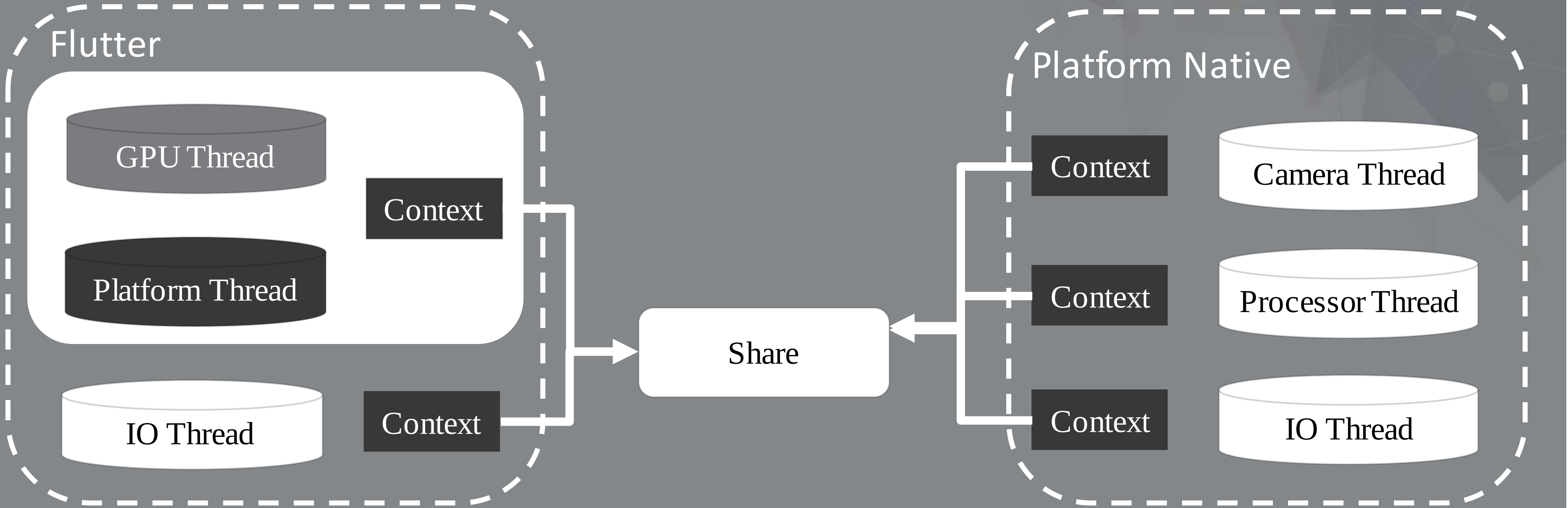
外接纹理

Flutter与视频的桥梁



外接纹理

Flutter与视频的桥梁



1：Flutter 外接纹理　SurfaceTexture → OpenGL Texture

2：Flutter OpenGL Context 透出

3：子线程 OpenGL 操作

外接纹理2.0 --------

基于共享纹理的外接纹理

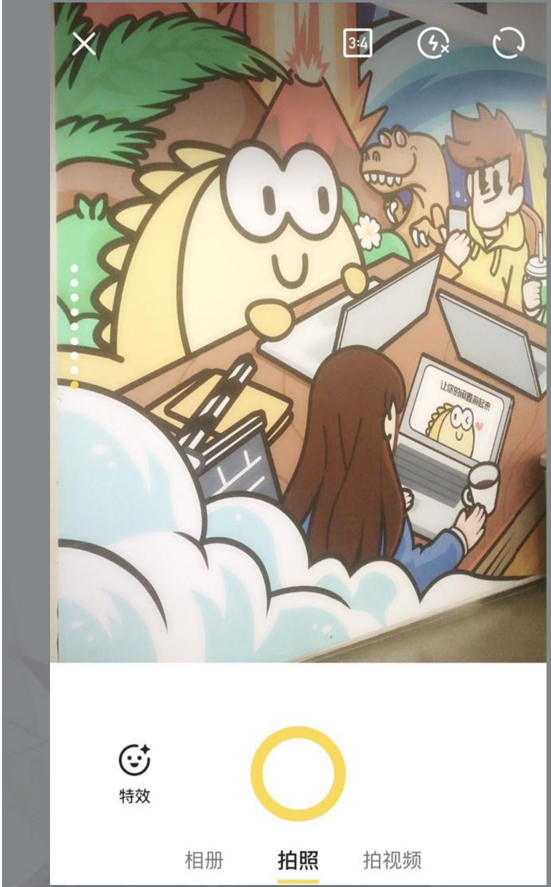
TPM

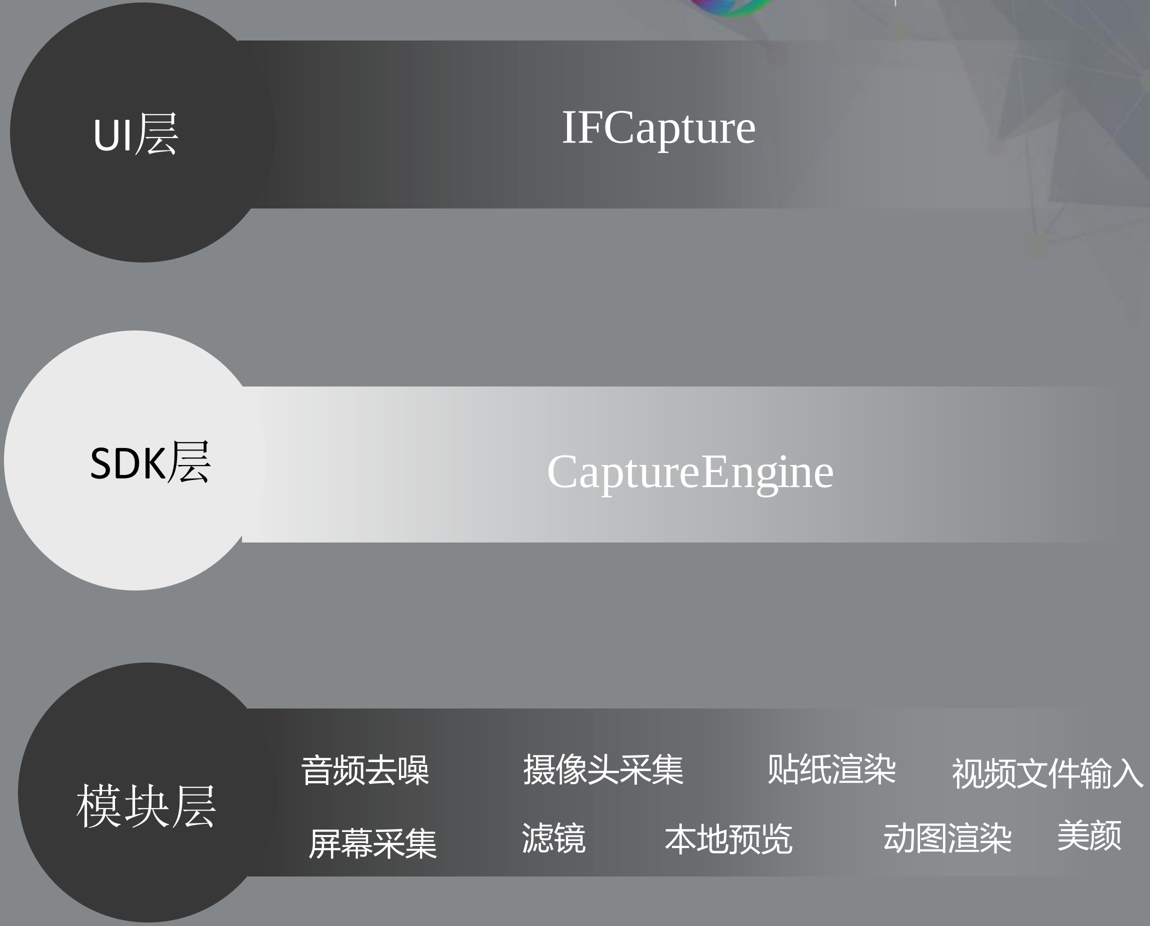
基于纹理管线的多媒体框架

```
size_t width = CVPixelBufferGetWidth(pixelBuf);
size_t height = CVPixelBufferGetHeight(pixelBuf);

dispatch_async(self.cameraQueue, ^{

    [EAGLContext setCurrentContext:self.glContext];

    if (self.frameTexture == 0) {
        self.frameTexture = [IFGLUtil createTextureWithWidth:width andHeight:height];
    }

    [self renderPixelBuffer:pixelBuf toTexture:self.frameTexture];
});
```

03 TPM

基于纹理管线的多媒体框架





UI层 IFCapture

SDK层 CaptureEngine

模块层

音频去噪 摄像头采集 贴纸渲染 视频文件输入

屏幕采集 滤镜 本地预览 动图渲染 美颜

TPM

基于纹理管线的多媒体框架

1：管线和数据 --------- 血管和血液

2：模块的抽象 ---------- 器官

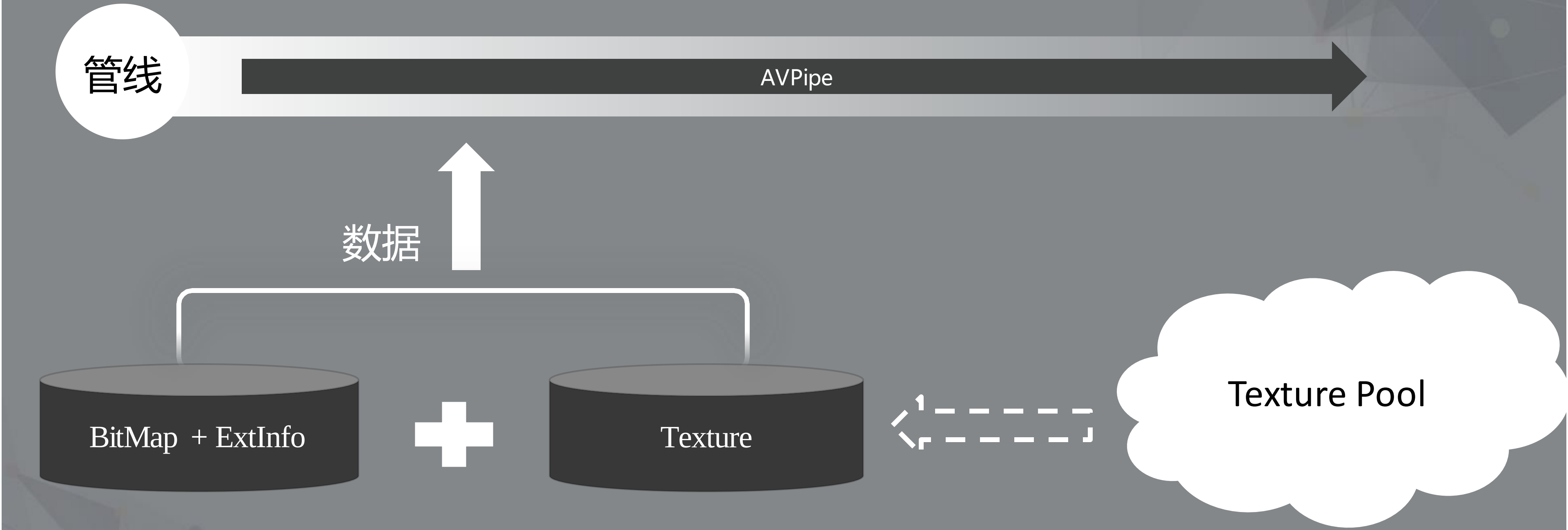
3：线程统一管理模块 ---------- 骨架

4：上下文的统一管理模块---------- 灵魂

TPM

基于纹理管线的多媒体框架

管线和数据 --------- 血管和血液



模块的抽象 ---------- 器官

采集

- 摄像头采集
- 视频文件输出
- 屏幕采集
- 网络视频流
- 网络音频流
- 麦克风采集
- 音频文件输出

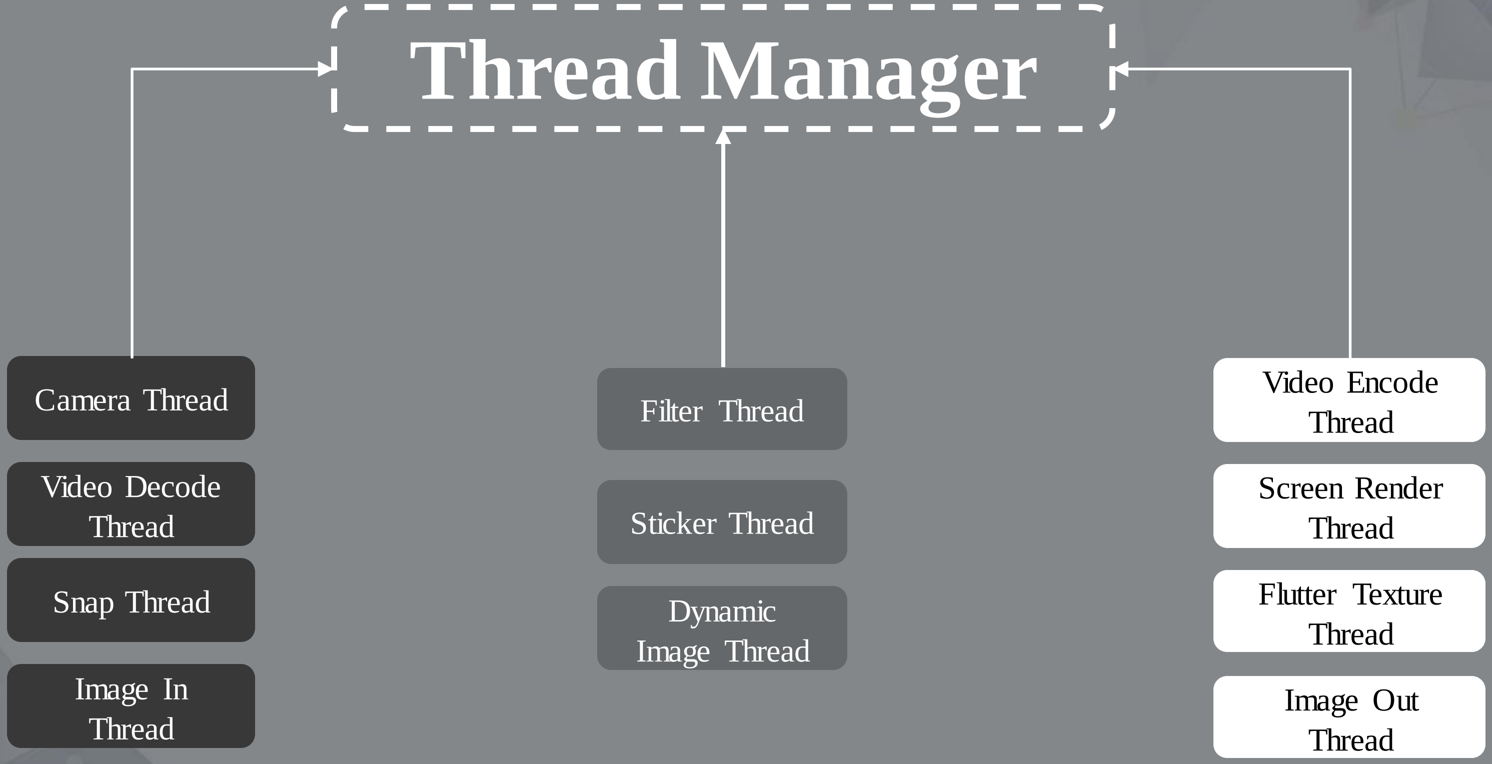
处理

- 美颜
- 滤镜
- 动图
- 贴纸
- 换脸
- 水印
- 去噪
- 变声

输出

- 视频文件输入
- 本地预览
- 音频文件写入
- 音频播放

线程的统一管理---------- 骨架



Thread Manager

Camera Thread

Video Decode Thread

Snap Thread

Image In Thread

Filter Thread

Sticker Thread

Dynamic Image Thread

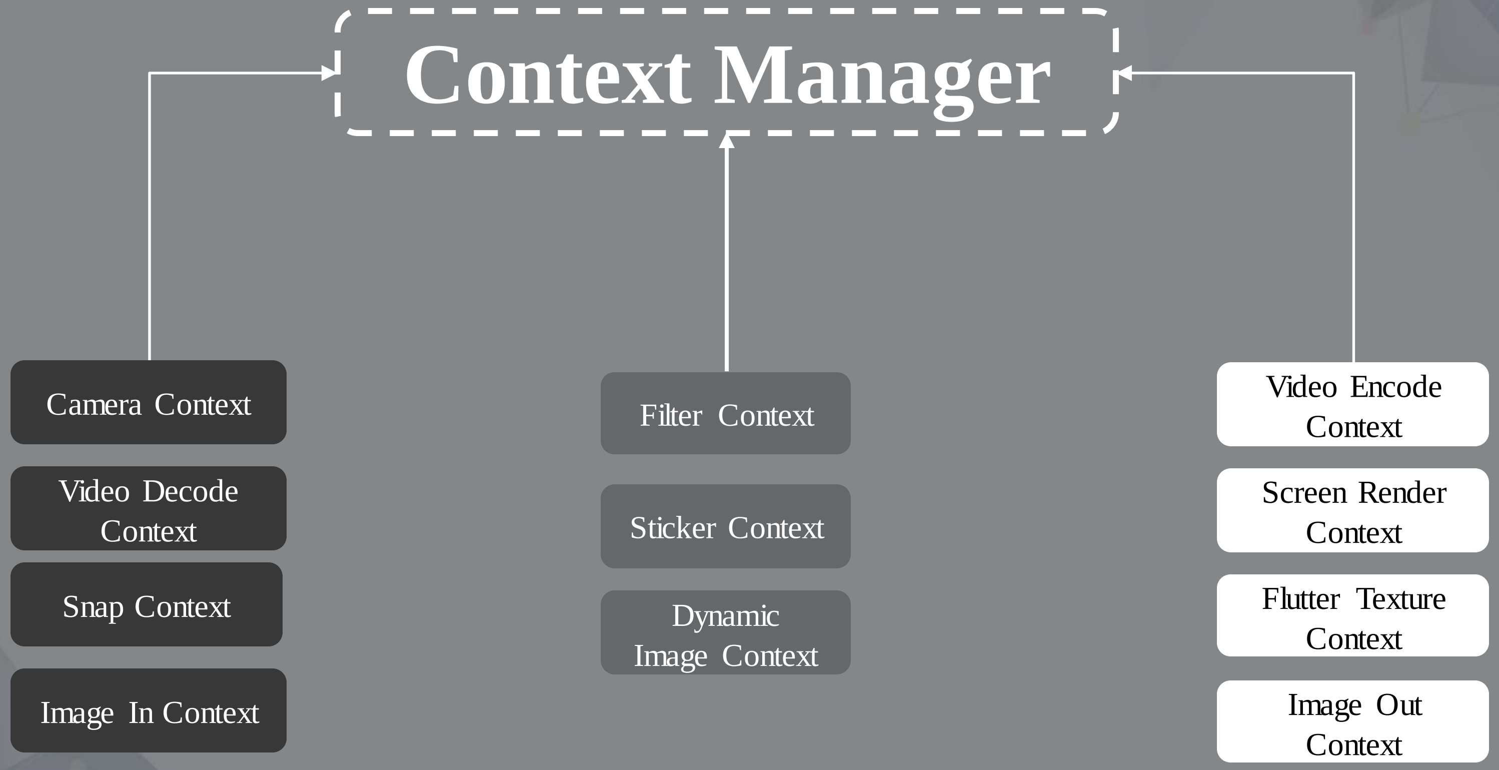
Video Encode Thread

Screen Render Thread

Flutter Texture Thread

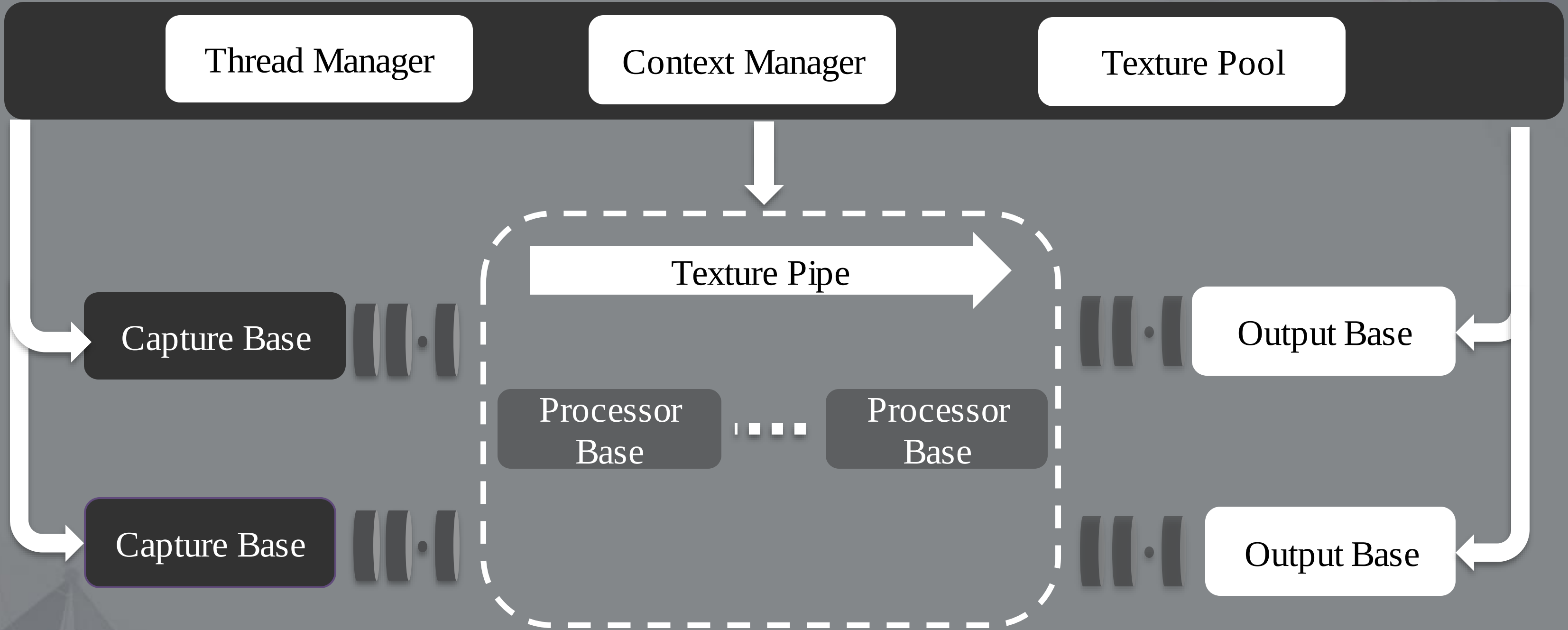
Image Out Thread

上下文的统一管理---------- 灵魂


Context Manager
Camera Context
Video Decode Context
Snap Context
Image In Context
Filter Context
Sticker Context
Dynamic Image Context
Video Encode Context
Screen Render Context
Flutter Texture Context
Image Out Context

TPM

基于纹理管线的多媒体框架



TPM

基于纹理管线的多媒体框架

一：需要什么模块

- 摄像头模块 → 视频文件解码模块
- 滤镜处理模块
- Flutter画面渲染模块

二：配置模块参数：分辨率、滤镜参数、前后置等等

三：创建视频管线

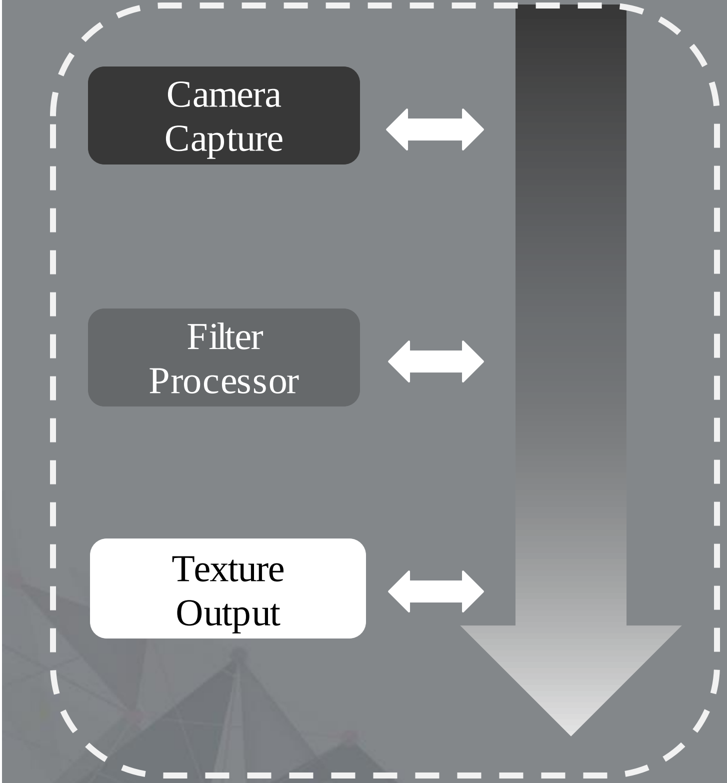
四：使用已配置的参数，创建模块

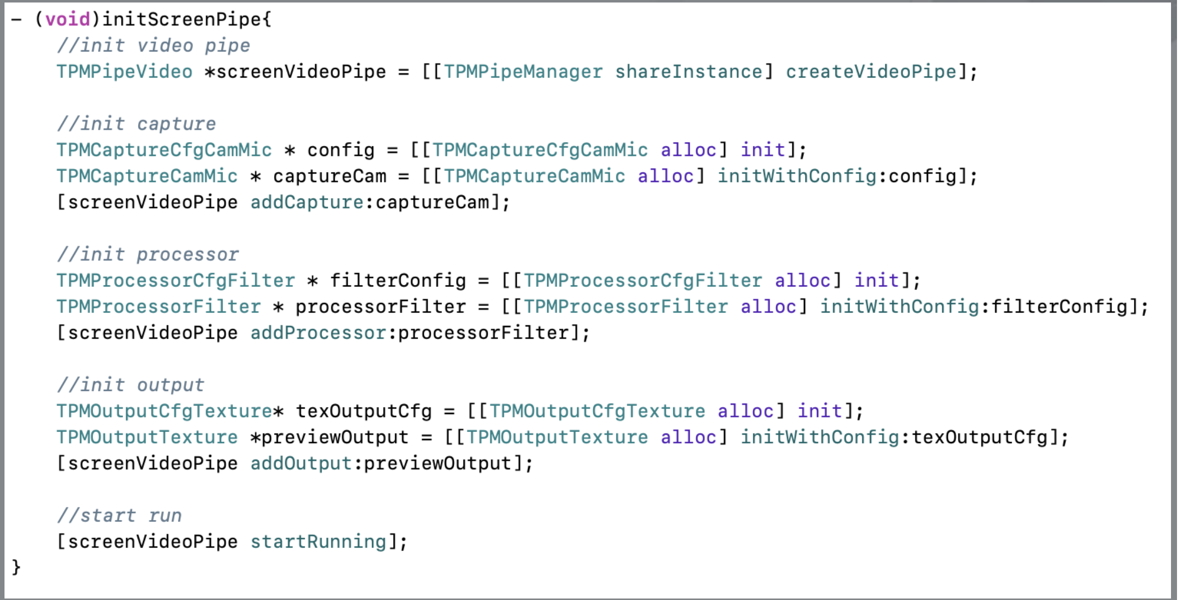
五：管线搭载模块，开启管线

03

TPM

基于纹理管线的多媒体框架

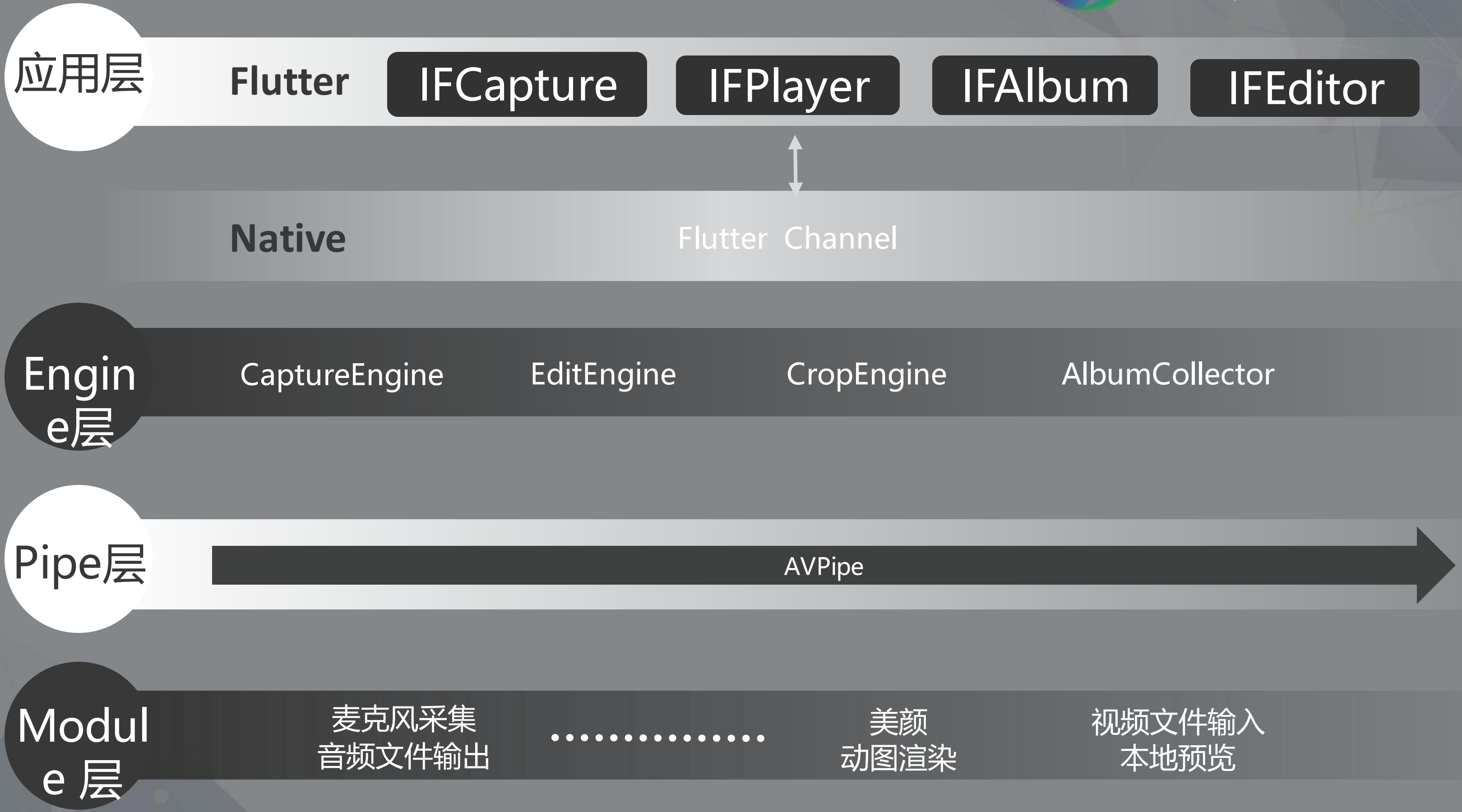




```
- (void)initScreenPipe{
    //init video pipe
    TPMPipeVideo *screenVideoPipe = [[TPMPipeManager shareInstance] createVideoPipe];

    //init capture
    TPMCaptureCfgCamMic * config = [[TPMCaptureCfgCamMic alloc] init];
    TPMCaptureCamMic * captureCam = [[TPMCaptureCamMic alloc] initWithConfig:config];
    [screenVideoPipe addCapture:captureCam];

    //init processor
    TPMProcessorCfgFilter * filterConfig = [[TPMProcessorCfgFilter alloc] init];
    TPMProcessorFilter * processorFilter = [[TPMProcessorFilter alloc] initWithConfig:filterConfig];
    [screenVideoPipe addProcessor:processorFilter];

    //init output
    TPMOutputCfgTexture* texOutputCfg = [[TPMOutputCfgTexture alloc] init];
    TPMOutputTexture *previewOutput = [[TPMOutputTexture alloc] initWithConfig:texOutputCfg];
    [screenVideoPipe addOutput:previewOutput];

    //start run
    [screenVideoPipe startRunning];
}
```

04 闲鱼Flutter

多媒体开源



应用层

Flutter

IFCapture

IFPlayer

IFAlbum

IFEditor

Native

Flutter Channel

Engine层

CaptureEngine

EditEngine

CropEngine

AlbumCollector

Pipe层

AVPipe

Module 层

麦克风采集
音频文件输出

……………

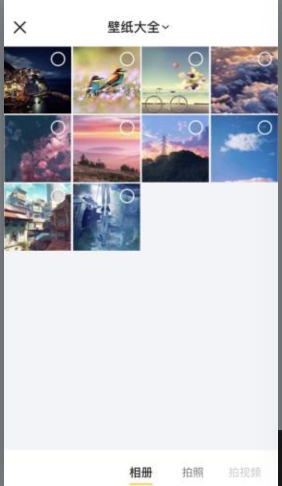
美颜
动图渲染

视频文件输入
本地预览

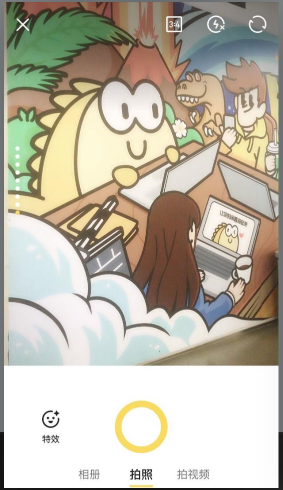
04 闲鱼Flutter

多媒体开源组件

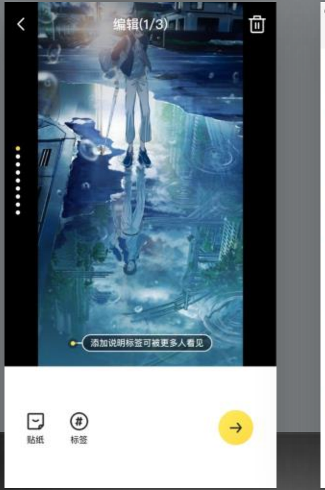
相册组件



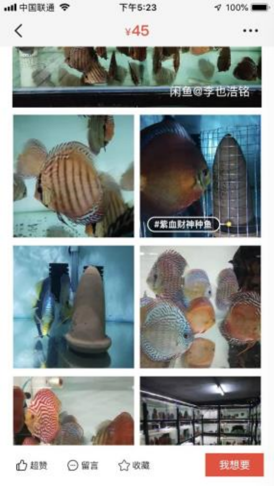
拍摄组件



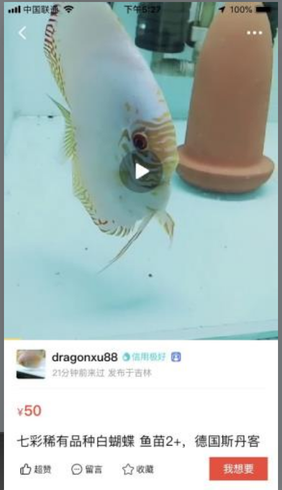
编辑组件



图览组件



播放器组件



Future

1
完全的跨端

2
开源共建丰富框架内容

Thank you