

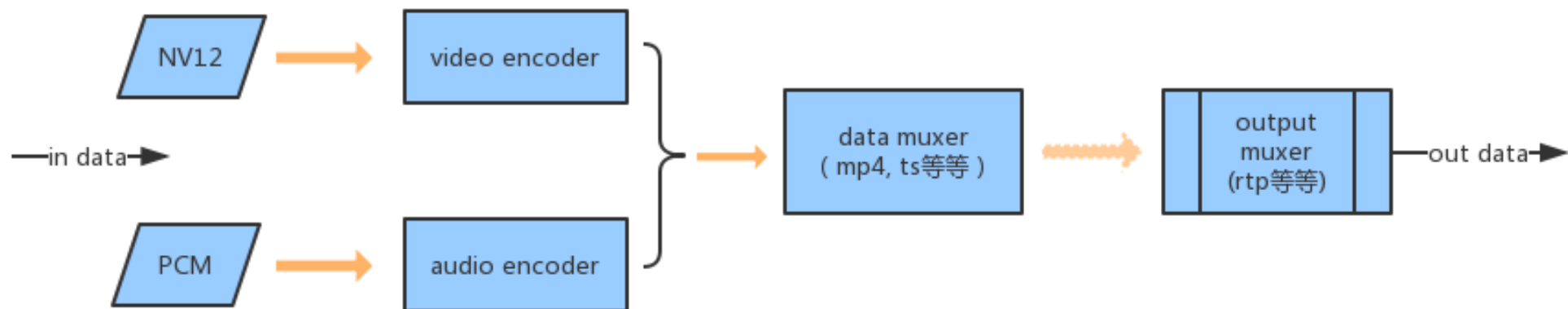
RK1108 AV Development Introduction

Sep., 2016
Dept.Ⅲ 王航

Agenda

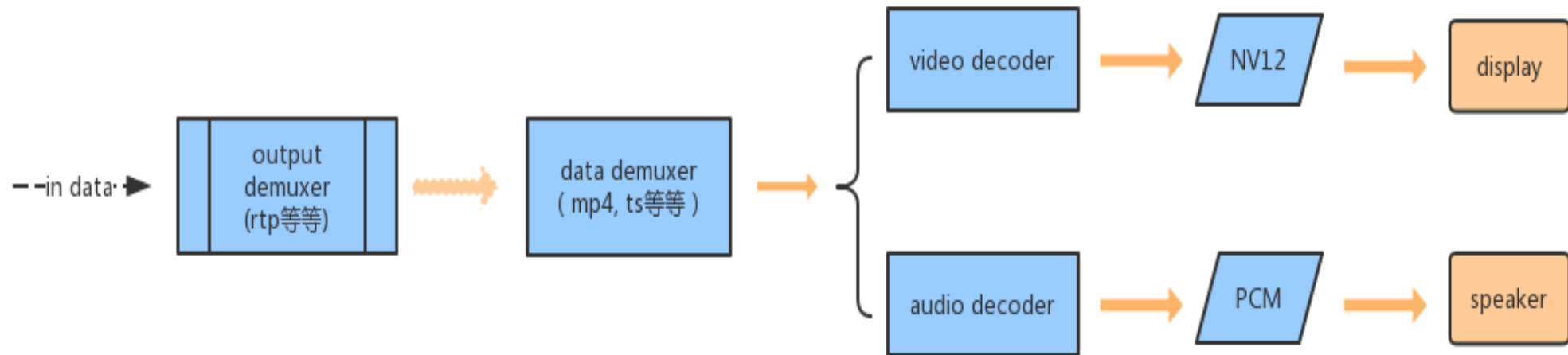
- **AV Development Work Content (What to do)**
- **Function Realization (What to do)**
- **Interface Selection (How to do)**
- **Q&A**

AV Development Work Content



编码流程图

AV Development Work Content



解码流程图

Function Realization

- RK already realized
 - Multi-channel video saved to sd card
 - Network video client real-time preview
 - Motion detection video
 - Emergency video
 - Plate- end Video Playback
- Customer need to realize
 - ? ?

Function Realization

● Encoding Points

■ Various Input Source Data

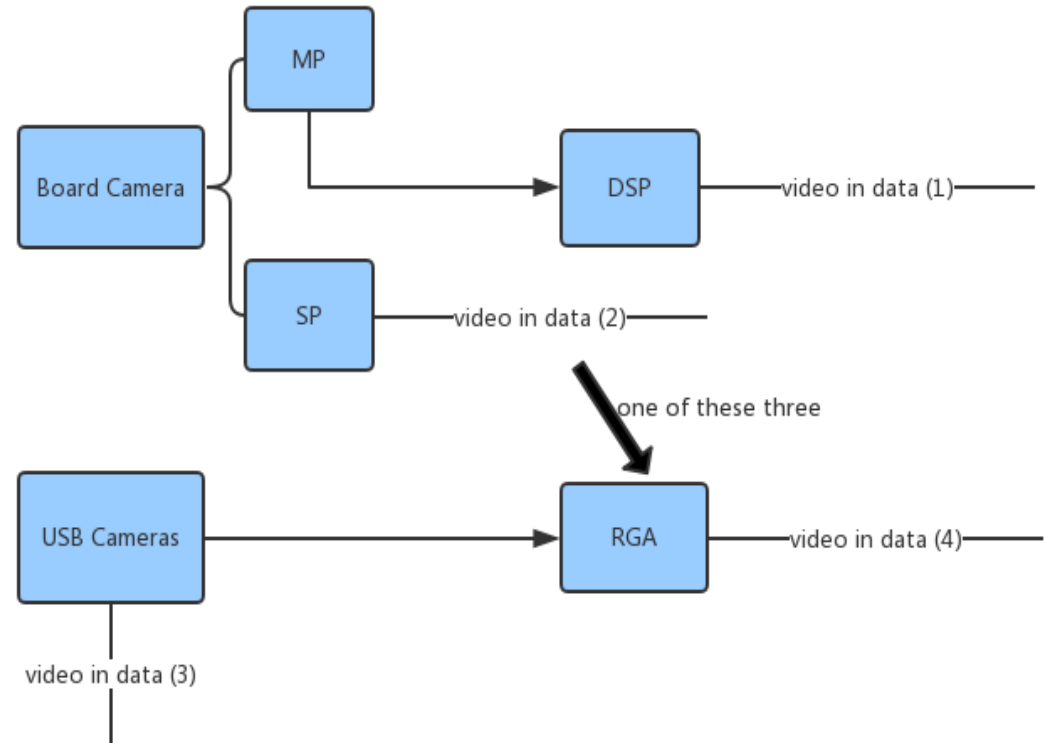
◆ Board Camera

- MP (main path) $\geq 1920 \times 1080$
- SP (self path) $\leq 1920 \times 1080$

◆ USB Camera

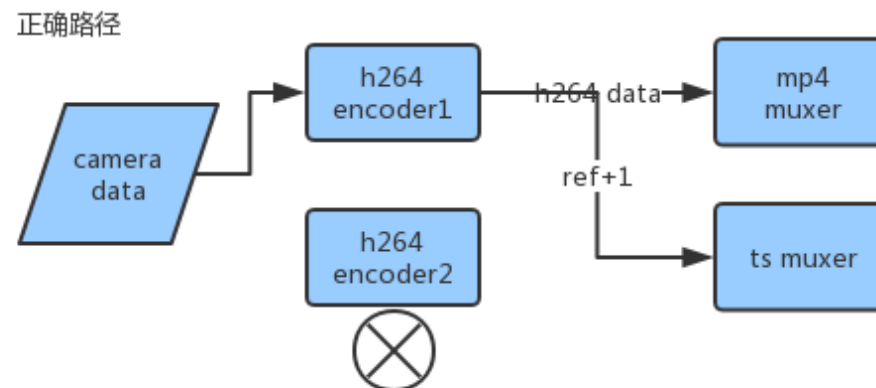
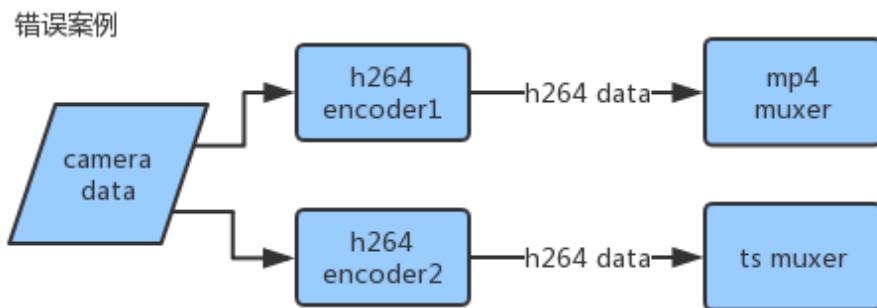
◆ Image Processing Back Data

- DSP
- RGA



Function Realization

- Encoding Points
 - Functions can be random switched to reduce memory access load
 - ◆ Input source data and compiler one-to-one correspondence



Interface Selection

1. Interfaces RK Already Realized

———— For customer use rk demo app directly

- Encoder mp4 write in sd card

- int video_record_startrec(void);
 - Function Declaration: start recording and write in
- void video_record_stoprec(void);
 - Function Declaration: stop recording
- ✓ Key configuration (refer to video_encode_init function)

配置encode config, 音视频参数 (视频格式固定为nv12)

图像宽高 Width, Height

视频码率 video_bit_rate

视频帧率 stream_frame_rate

video_encoder_level

I帧间隔 video_gop_size

音频码率 audio_bit_rate

音频帧率 audio_sample_rate

音频声道 channel_layout

音频采样数 input_nb_samples

音频数据格式 input_sample_fmt

Interface Selection

1. Interfaces RK Already Realized

———— For customer use rk demo app directly

- Image Real-time Preview in Client-side
 - void video_record_start_ts_transfer(char *url);
 - Function Declaration: Start ts stream network transmission
 - Input Parameter url: protocol and transmission address, such as udp://239.1.1.1:1234
 - void video_record_stop_ts_transfer(char sync)
 - Function Declaration: Stop ts stream network transmission

Interface Selection

1. Interfaces RK Already Realized

For customer use rk demo app directly

- Audio File Play

- int audio_play0(char *audio_file_path)

- Function Declaration: Start ts stream network transmission
 - Input Parameter audio_file_path: file path address, such as /usr/share/sounds/click.wav

- Video File Play

- int videoplay_init(char *filepath, HWND hWnd)

- Function Declaration: Initialize videoplay
 - Input Paramete filepath : file path address, such as /mnt/sdcard/nor/20160925.mp4
 - hWnd : ui handle

- int videoplay_exit(void)

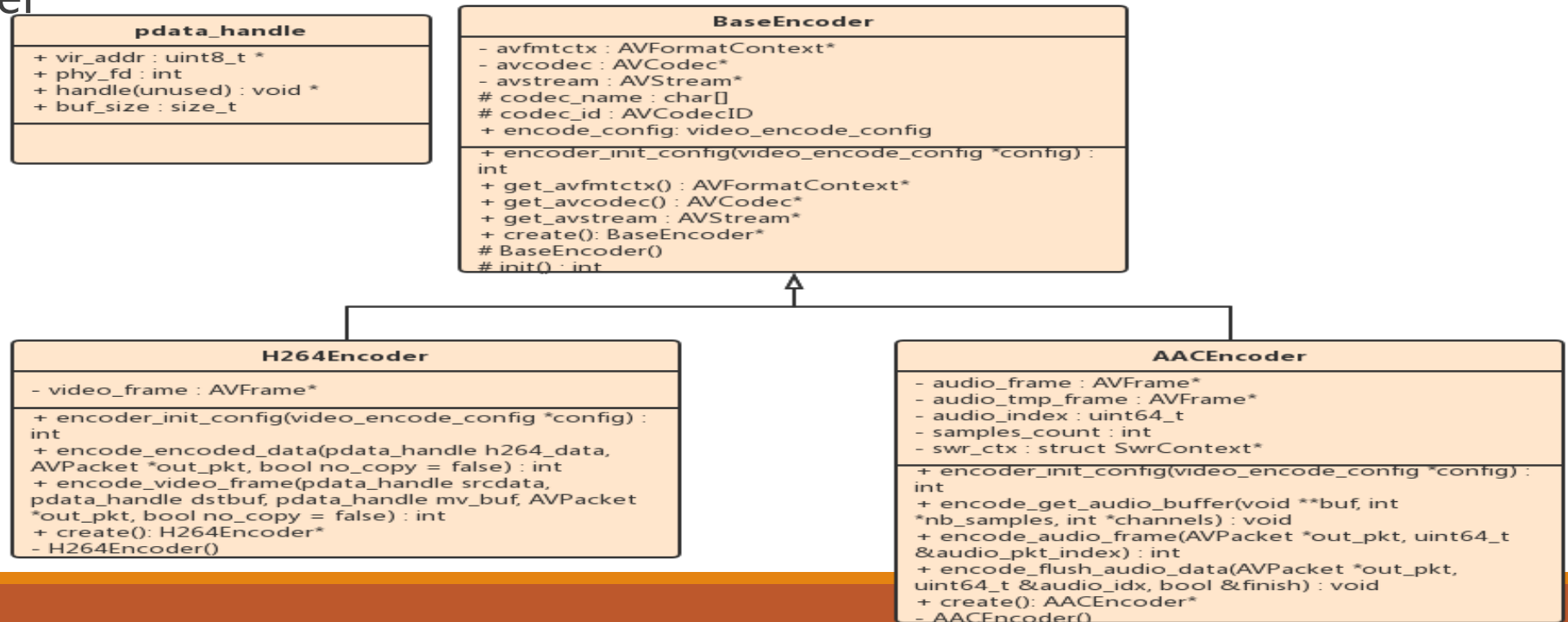
- Function Declaration: Exit file play

Interface Selection

2. AV Encapsulations RK Already Realized

———— For customer wants to manage above threads and data, but doesn't care about details such as AV coding encapsulation of the customer

- Encoder

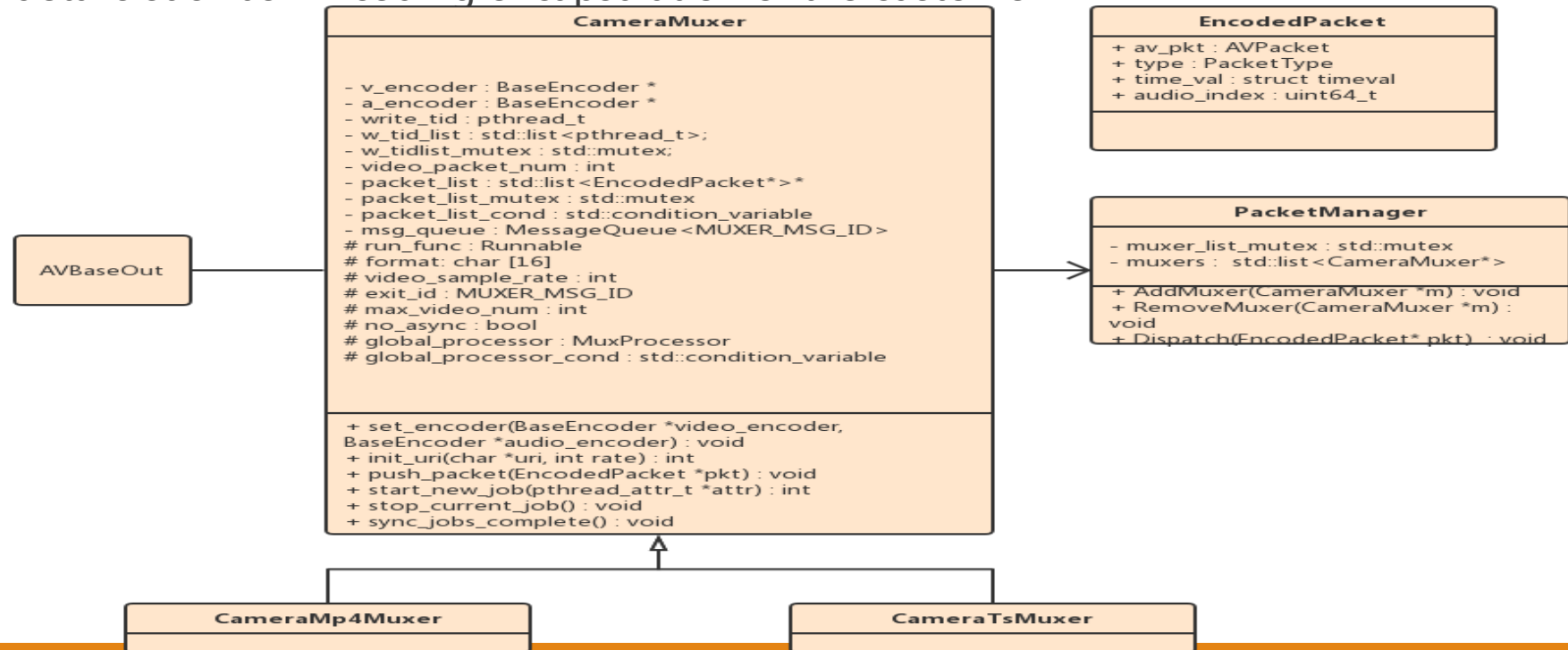


Interface Selection

2. AV Encapsulations RK Already Realized

For customer wants to manage above threads and data, but doesn't care about details such as AV coding encapsulation of the customer

- Files

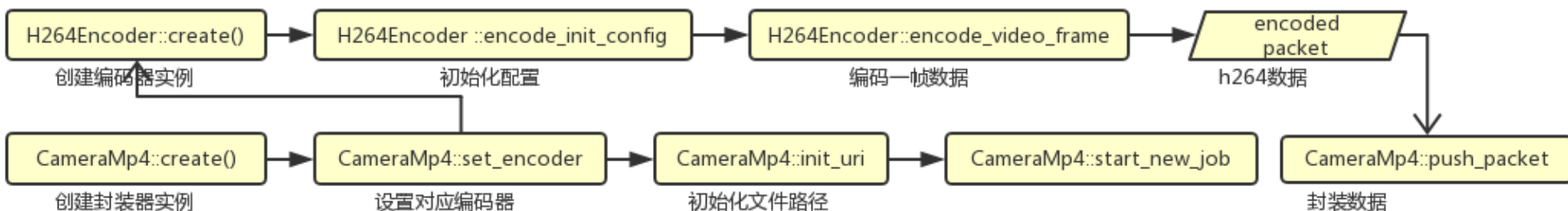


Interface Selection

2. AV Encapsulations RK Already Realized

—— For customer wants to manage above threads and data, but doesn't care about details such as AV coding encapsulation of the customer

- Samples



Interface Selection

3. ffmpeg

_____ For customer wants to manage above threads and data , familiar with ffmpeg

● ffmpeg Advantages

- Support full-format (mp4 TS ...)
- Good Expansibility
 - ◆ If a new file format is needed, as long as add corresponding compiler options
- Easy to add new codec
 - ◆ Corresponding to our codec drive, achieve the init, encode/decode, deinit
- Rich Network Resource, Developers Are Accessible
- Convenient Joint Test for Some Early Functions
 - ◆ Such as rtp network output protocol, ffmpeg has ready-made implementation, can be used for mobile terminal development testing, don't need to wait for realizing your plate end rtp transmission, etc
- RK codec is Integrated

Interface Selection

3. ffmpeg

———— For customer wants to manage above threads and data , familiar with ffmpeg

- ffmpeg compiling

- Refer to \$(ffmpeg code path)/autoconfig.sh

- ◆ Pay attention to copyright issues of supported format, don't compile unnecessary formats, also can reduce the size

- ◆ Mainly Revise--enable-encoder, --enable-decoder, --enable-muxer, --enable-demuxer, --enable-protocol

Interface Selection

3. ffmpeg

- _____ For customer wants to manage above threads and data , familiar with ffmpeg
- ffmpeg Interface in Use

- Refer to \$(ffmpeg code path)/doc/examples/muxing.c and demuxing.c , or refer to BaseEncoder and CameraMuxer , DecodeDemuxer

- Key Structure

- ◆ AVFormatContext
 - AVStream
 - AVCodecContext
 - AVInputFormat / AVOutputFormat AVIOContext
- ◆ AVFrame
- ◆ AVPacket

Because hardware requires continuous physical memory blocks, AVFrame and AVPacket are modified, uint32_t user_reserve_buf[8] is added to store the description of continuous memory block physical structure pdata_handle.

Interface Selection

4. rk video codec api

———— For customer only interests in ip, and have AV experience

- Refer to \$(ffmpeg code path)/libavcodec/mpp_encoder.c和mpp_decoder.c
 - See api video - 《视频编解码 - 陈恒明》

Q&A

Thanks!