H.264 encoder base class

RFC

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Is it possible to have a H.264 encoder base class for specific hardware accelerated encoders?

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H.264 decoder base class

- Originally from Seungha and Nicolas
  - D3D11, D3D12, DXVA
  - NVCODEC (NVIDIA-CUDA)
  - V4L2codec (stateless V4L2)
  - VA
  - Vulkan

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Encoders are different

- Each hwaccel implements its own subset of the specification
- Different limitations

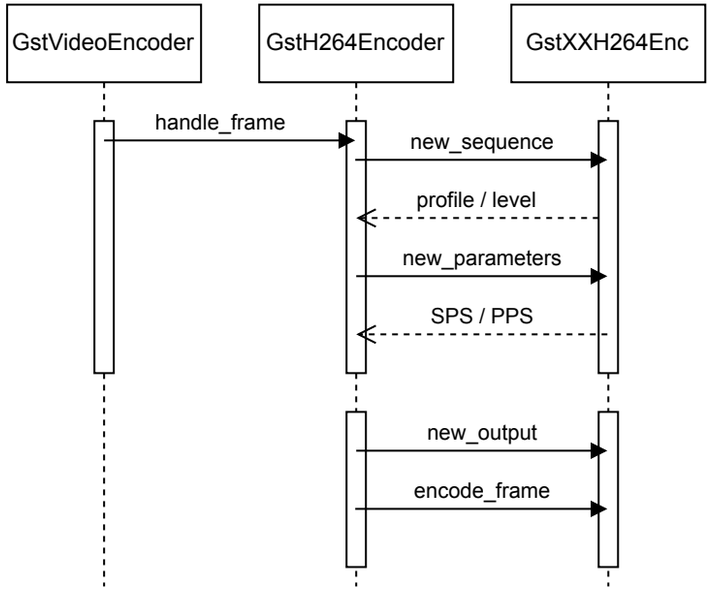
FFmpeg case

- Iteratively decoupled vaapi encoder functions to a generic helper
  - released 7.1
  - used in d3d12 (partially), vaapi and vulkan

Design

1. Subclass set hardware limitation (lists size, b frames support, etc.)
2. Base class define GOP structure [IDR, P/I/B, ...)
3. Proposes parameter sets and other structure (SPS, PPS)
   - Table A-1 for bitrate limits
   - subclass could modify those structures (warning!)
4. Encode frame passing reference lists and slice header

Sequence



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Properties

- **IDR period**: number of frames between two IDR frame
- **B frames**: number of consecutive B-Frames
- **I frames**: Force the number of I-frames insertion within one GOP
- **Number of reference frames**: number of frames can be referenced by P-Frames and B-Frames
- **B pyramid**: Enable the b-pyramid reference structure in GOP

Virtual methods

- **new_sequence**: Allows to negotiate downstream profile and level
- **new_parameters**: called when configuration changes and H.264 parameters change
- **new_output**: called whenever a new frame is created
- **encode_frame**: provide the frame to be encoded with the reference lists
- **prepare_output**: called before pushing @frame downstream
- **reset**: called when resetting the global state of the encoder

Pending

- SEI message support
- Static-Fixed GOP
  - No look-ahead
  - No second pass