

The background of the slide is a vibrant red. It is decorated with various digital and network-themed graphics. On the left side, there are faint, semi-transparent icons of a code editor with a '</>' symbol, a waveform graph, and a circular target-like graphic. Scattered across the middle are binary digits '0' and '1'. On the right side, a complex network of white lines connects numerous small white dots, with a few larger dots acting as hubs. A bright white starburst or lens flare effect is positioned near the center of this network. The overall aesthetic is high-tech and futuristic.

# AHG17: Picture Header

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# Introduction

- Syntax elements in the slice header transmitted once per slice
  - Some syntax elements are already constrained to be the same in all slices of a picture.
  - Unclear if other syntax elements really need capability to change within a picture
- Motivation is to reduce complexity impact of processing a large number of syntax elements in every slice header

# Proposal

- Add a mandatory picture header transmitted once per picture as the first VCL NAL unit of a picture
- Move syntax elements from the slice header to this picture header
- Two groups of syntax elements identified:
  - Already constrained to be the same in all slices of a picture
  - Not currently constrained to be the same in all slices of a picture

# Syntax already constrained (1/2)

- Section 7.4.7.1:

When present, the value of each of the slice header syntax elements `slice_pic_parameter_set_id`, `non_reference_picture_flag`, `colour_plane_id`, `slice_pic_order_cnt_lsb`, `recovery_poc_cnt`, `no_output_of_prior_pics_flag`, `pic_output_flag`, and `slice_temporal_mvp_enabled_flag` shall be the same in all slice headers of a coded picture.

(The `recovery_poc_cnt` and `no_output_of_prior_pics_flag` are not moved to the picture header in this contribution because their presence in the slice header is dependent on a conditional check of the slice header `nal_unit_type`.)

## Syntax already constrained (2/2)

- Section 7.4.7.1:

When present, the value of slice\_lmcs\_aps\_id shall be the same for all slices of a picture.

When present, the value of slice\_scaling\_list\_aps\_id shall be the same for all slices of a picture.

# Syntax not currently constrained

- Unclear benefit and coding loss to transmitting some syntax elements in every slice header as their anticipated usage would be to change at the picture level (not the slice level):
  - Group 1:
    - six\_minus\_max\_num\_merge\_cand
    - five\_minus\_max\_num\_subblock\_merge\_cand
    - slice\_fpel\_mmvd\_enabled\_flag
    - slice\_disable\_bdof\_dmvr\_flag
    - max\_num\_merge\_cand\_minus\_max\_num\_triangle\_cand
    - slice\_six\_minus\_max\_num\_ibc\_merge\_cand

# Syntax not currently constrained

- Unclear benefit and coding loss to transmitting some syntax elements in every slice header as their anticipated usage would be to change at the picture level (not the slice level):
  - Group 2:
    - partition\_constraints\_override\_flag
    - slice\_log2\_diff\_min\_qt\_min\_cb\_luma
    - slice\_max\_mtt\_hierarchy\_depth\_luma
    - slice\_log2\_diff\_max\_bt\_min\_qt\_luma
    - slice\_log2\_diff\_max\_tt\_min\_qt\_luma
    - slice\_log2\_diff\_min\_qt\_min\_cb\_chroma
    - slice\_max\_mtt\_hierarchy\_depth\_chroma
    - slice\_log2\_diff\_max\_bt\_min\_qt\_chroma
    - slice\_log2\_diff\_max\_tt\_min\_qt\_chroma

# Syntax not currently constrained

- Unclear benefit and coding loss to transmitting some syntax elements in every slice header as their anticipated usage would be to change at the picture level (not the slice level):
  - Group 3:
    - mvd\_l1\_zero\_flag
  - Group 4:
    - dep\_quant\_enabled\_flag
    - sign\_data\_hiding\_enabled\_flag





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