REMOVING A LEVEL RESTRICTION ON CODING TREE BLOCK SIZE

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Eran Pinhasov, Shevach Riabtsev & Assaf Menachem

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- Current standard disallows 16x16 CTBs for level 5 and above (Annex A, section A.4.1)

- This restriction was proposed in JCTVC-J0334, reporting 16x16 CTBs add overheads for decoders
  - Up to 10% increase in worst-case decode time
  - Add ~1KB storage for 4K wide video (for top-line SAO params)

- However, this restriction imposes substantial complication and cost for encoders targeting HEVC 4K
  - Especially for legacy AVC\H.264 encoders upgrading to HEVC, using 16x16 architectures

CTB Size Restriction Impact on Encoders

- **Breaks legacy 16x16 AVC\H.264 implementations**

- **Increases cost of HW solutions**
  - Affects typical on-chip memories (sensitive to CTB size):
    - Target & Reference image data
    - Buffers between pipeline stages (coefficients, predictors, reconstructed and filtered data)
  - Usage of 32x32/64x64 CTBs increases memory by at least ~25KB/100KB compared to 16x16 CTB (by analyzing a basic pipelined encoder architecture)
  - Line-buffer & memory increase in proprietary components such as:
    - Pre or post video processing (e.g. scaler, de-interlacer, image-enhancement etc.)
    - Reference image cache or memories

- **CTB size restriction has significant impact on encoders**
  - Limits implementation flexibility
  - Imposes complication and adds significant cost
  - Breaks legacy AVC\H.264 16x16 based architecture

- **Recommending the removal of the CTB size limitation in Annex A, allowing 16x16 CTBs in all levels**