

ADDING A LEVEL RESTRICTION ON CODING TREE BLOCK SIZE

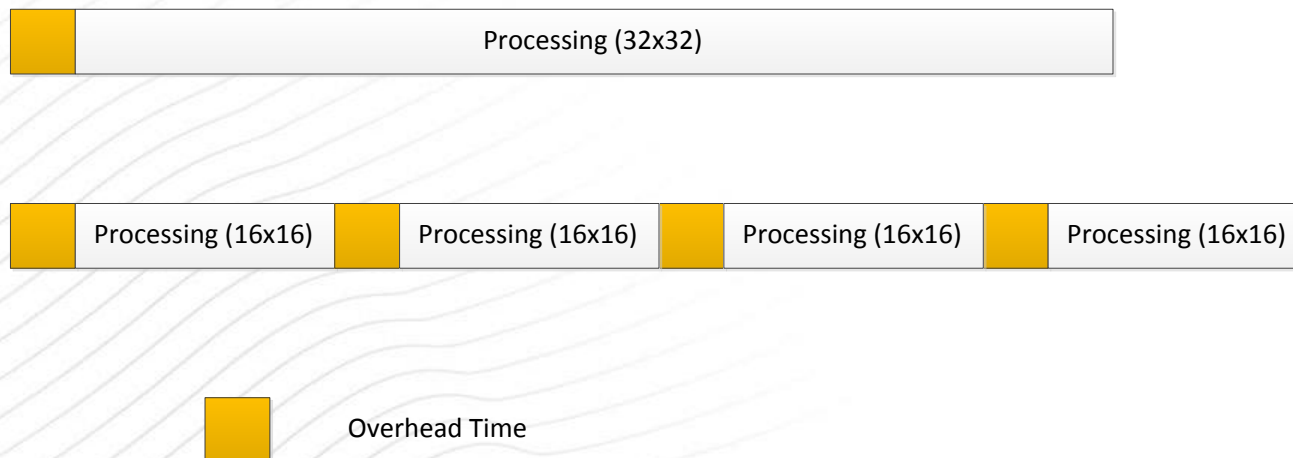
JCTVC-J0334



Wade Wan and Tim Hellman
10th JCT-VC Meeting – July 2012

- The HEVC standard currently allows three CTB sizes: 16x16, 32x32 and 64x64.
- Trade-off between coding efficiency (larger CTB) and encoder/decoder latency (smaller CTB).
- However, small CTB size comes with a cost to pipelined decoders

- **Every pipeline stage has fixed overhead per CTB regardless of CTB size**
 - Impact is 4x for 16x16 CTB versus a 32x32 CTB
 - The cumulative overhead for the 16x16 CTB can represent up to a 10% increase in overall worst-case decode time as compared to a 32x32 CTB.
- **A small CTB size increases the amount of on-chip line buffering for SAO filter implementation**
 - Eliminating 16x16 CTB cuts the size of this line buffer in half, saving over 1K byte of memory for a 4K wide picture.



- **Recommends a level-specific limit on Coding Tree Block (CTB) size to facilitate high-performance decoder implementations**
- **Limit the minimum CTB size to 32x32 for level 5 and higher**
- **Substantial performance improvement and line buffer reduction with negligible difference in best-case latency**