



# CE12.3.3: Reducing Motion Data Line Buffers

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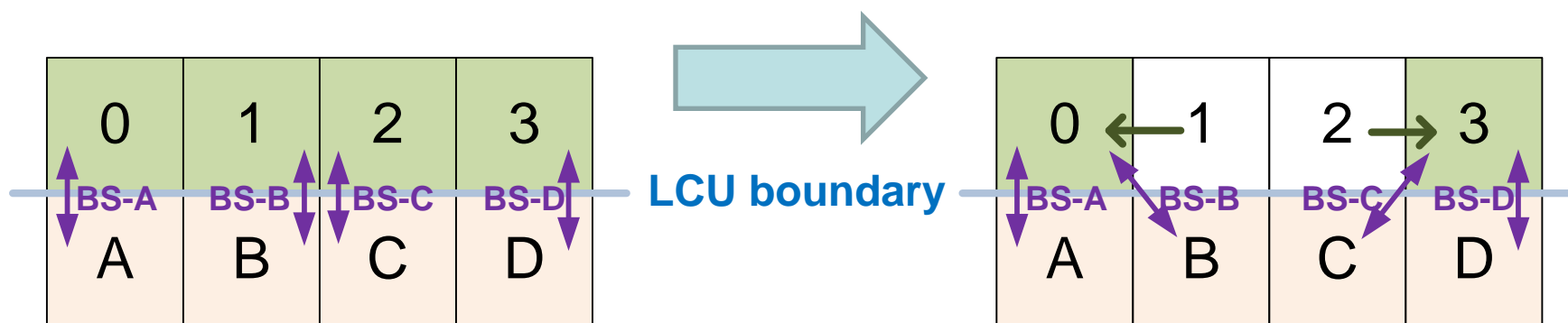
Presented by Tzu-Der Chuang,  
7<sup>th</sup> JCT-VC Meeting in Geneva  
21-30 November, 2011

# Overall Summary

- A motion data compression method to reduce the line buffer size
  - The motion data is subsampled by 2 in motion data line buffer
  - Reduce 50% of motion data storage without bit rate increase
    - Reduce 4.9K bytes of memory in 4Kx2K video coding
- Was adopted in Torino meeting, but because it affects the deblocking filter, this proposal has been put back to the CE to make sure there is no subjective quality degradation
- Gary's note at 2011/08/09
  - “It should be further studied in the CE12 Core Experiment on Deblocking Filtering to **ensure that it does not have any adverse effect on the subjective quality of the deblocking filter.**
  - **If no such problem is observed, we would then expect it to be adopted** into the design at the November meeting in Geneva.”

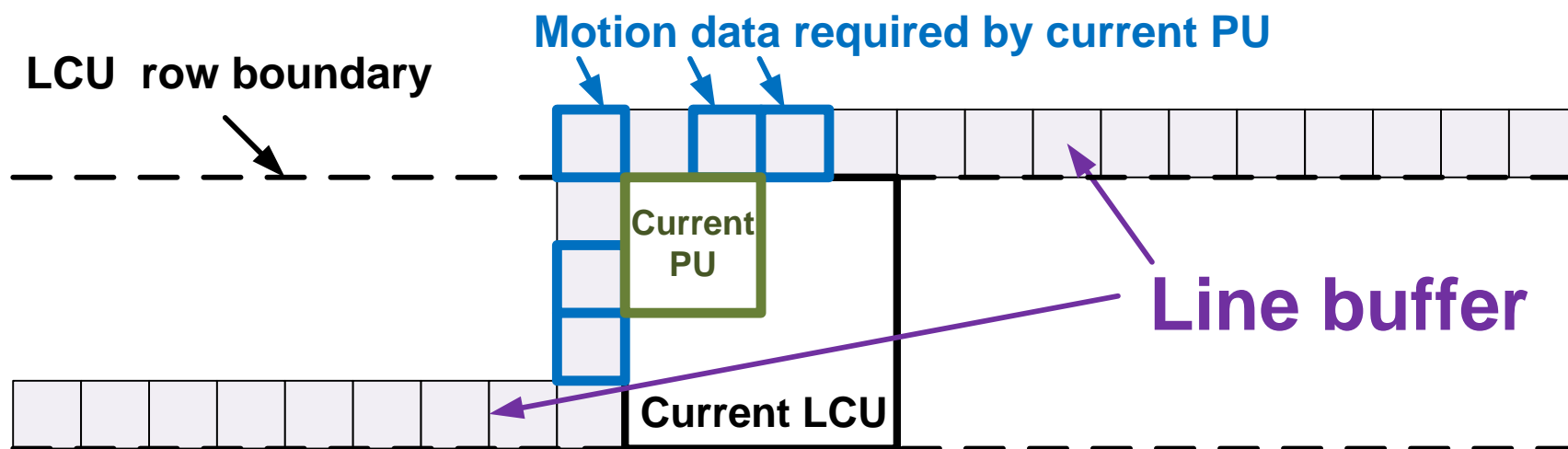
# Subjective View Test

- Since the motion data compression will affect the derivation of boundary strength in de-blocking, the subjective view test is evaluated
  - BS = 0  $\leftrightarrow$  BS = 1 if upper PUs are in inter 4x8 partition
- Similar visual quality is observed by proponents
  - Qualcomm (cross-checker) : “Visual qualities are very similar. Did not notice any artifacts that are significantly worse than the anchor.”



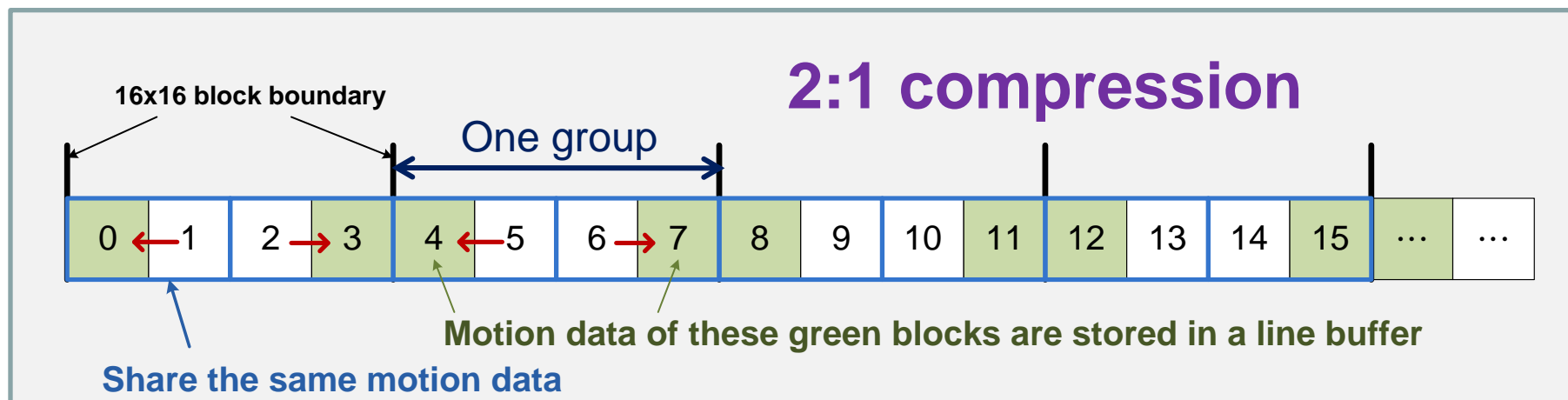
# Motion Data Line Buffer

- The motion data of upper blocks are required when deriving AMVP candidates and merge candidates
  - Need to store the inter\_dir, ref\_idx, MV in line buffers
  - Required 9.7K bytes memory in 4Kx2K video coding



## 2:1 Motion Data Compression

- The motion data is subsampled by 2 in motion data line buffer
- The motion data of the first and the last block represents the motion data of the first two and the last two blocks for every four blocks.
- Only 50% of memory is required (9.7K bytes to 4.9K bytes)



# Result- 2:1 Motion Data Compression

- Almost no bit rate increase, motion data line buffer is reduced by 50%

	Random Access HE			Random Access LC		
	Y	U	V	Y	U	V
Class A	0.0%	-0.1%	-0.1%	0.0%	0.1%	0.0%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class D	0.0%	-0.1%	0.1%	0.0%	0.0%	-0.1%
Class E						
<b>Overall</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	100%			100%		
Dec Time[%]	100%			101%		

	Low delay B HE			Low delay B LC		
	Y	U	V	Y	U	V
Class A						
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
Class C	0.0%	-0.1%	-0.1%	0.0%	0.2%	-0.3%
Class D	0.0%	0.2%	0.1%	0.0%	0.2%	0.0%
Class E	0.0%	0.2%	0.3%	0.0%	0.7%	-0.3%
<b>Overall</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>-0.2%</b>
	0.0%	0.1%	0.0%	0.0%	0.2%	-0.1%
Enc Time[%]	101%			100%		
Dec Time[%]	101%			100%		

# Cross Verification

- We thank Qualcomm for crosschecking our proposal
  - JCTVC-G292
- BD-rates and run times are confirmed

# Conclusions

- Proposed a 2:1 motion data compression method
  - Similar to temporal MV compression, but used for reducing the storage size of motion data line buffer
  - Reduce 50% of motion data storage without bit rate increase
- No undesirable visual artifact is observed in subjective view test
- Similar visual quality is observed by proponents
  - Qualcomm (cross-checker) : “Visual qualities are very similar. Did not notice any artifacts that are significantly worse than the anchor.”