



CE4 Subset2: Slice Boundary Filter

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Overall Summary

- This contribution reported the results of CE4 Subset2: slice boundary filter (SBF).
- SBF is useful only when slice-independent DF and ALF are enabled.
- For LCU-aligned 1500-byte slices, the bit rate saving of the SBF-on case is **0.1-0.3%** over the SBF-off case.
- For two slices per picture, the bit rate saving of the SBF-on case is **0-0.1%** over the SBF-off case.
- The subjective quality of enabling the SBF is often observed to be better than that of disabling the SBF.

Outlines

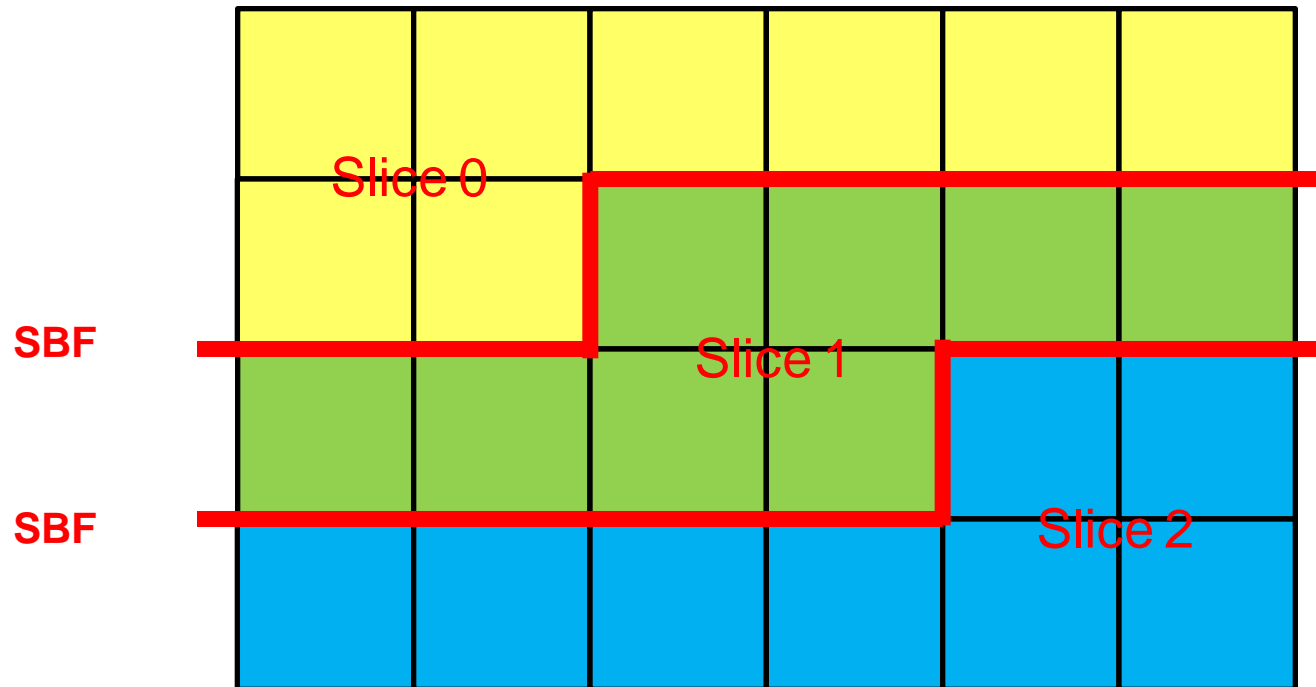
- Introduction
- Algorithm description
- Simulation results
- Conclusions

Introduction

- In the current HEVC, one picture can be partitioned into multiple LCU-aligned slices
- JCTVC-D128 proposed slice-independent DF and ALF
 - DF and ALF processes are not performed across slice boundaries in order to achieve parallel decoding of all slices
 - Decision: adopted
- JCTVC-D128 also proposed slice boundary filter (SBF)
 - Decision: further studied in CE4 Subset2

Slice Boundary Filter

- SBF is very similar to DF but only processes slice boundaries
 - Aimed to remove possible slice boundary artifacts caused by the slice-independent DF and ALF



Simulation Results (1/2)

- MediaTek's software based on HM 2.0
- LCU-aligned 1500-byte slices with slice-independent DF and ALF enabled
- Anchor: JCTVC-D600

BD-rate (%)	HE-AI	LC-AI	HE-RA	LC-RA	HE-LD	LC-LD
SBF off	5.6	5.8	4.7	4.5	2.7	2.7
SBF on	5.3	5.5	4.6	4.3	2.6	2.5

- SBF-on 0.1-0.3% better than SBF-off**

Simulation Results (2/2)

- MediaTek's software based on HM 2.0
- LCU-aligned , 2 slices per picture, slice-independent DF and ALF enabled
- Anchor: JCTVC-D600

BD-rate (%)	HE-AI	LC-AI	HE-RA	LC-RA	HE-LD	LC-LD
SBF off	0.6	0.6	1.3	1.2	1.6	1.4
SBF on	0.5	0.6	1.3	1.1	1.6	1.3

- SBF-on 0-0.1% better than SBF-off**

Subjective Quality Comparison (1/2)

- BlowingBubble, 416x240, QP=37, HE-AI, POC=7
- 1500 bytes per slice
- SBF-off v.s. SBF-on



Subjective Quality Comparison (2/2)

- BlowingBubble, 416x240, QP=37, HE-AI, POC=7
- 2 slices per picture
- SBF-off v.s. SBF-on



Conclusions

- CE4 Subset2 experiments were conducted to evaluate the slice boundary filter (SBF) when slice-independent DF and ALF are used
- The bit rate saving of the SBF-on case is 0.1-0.3% over the SBF-off case for LCU-aligned 1500-byte slices
- More importantly, the subjective quality of enabling the SBF is often observed to be better than that of disabling the SBF.

Description To Be Added in WD

- **sbef_flag** specifies whether the operation of the DF/AO/ALF shall be disabled across slice boundaries, and specifies the order of DF operations. The value of sbef_flag shall be in the range of 0 to 3, inclusive. sbef_flag equal to 0 specifies that all slice boundaries are filtered. sbef_flag equal to 1 specifies that DF/AO/ALF is disabled for all slice boundaries. sbef_flag equal to 2 specifies a two-stage DF process for the slice: After performing DF/AO/ALF processes for all slices without filtering across slice boundaries, the slice boundaries are processed by DF.



Thank you

