



# CE4 Subset1: Leaf-CU-Aligned Slices

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# Overall Summary

- This contribution reported the results of CE4 Subset1
- LCU-aligned slices reportedly better than leaf-CU-aligned slices

| 1500 bytes per slice<br>Anchor: JCTVC-D600 | BD-rate (%) |       |       | Bit Rate Inaccuracy (%) |       |       |
|--|-------------|-------|-------|-------------------------|-------|-------|
|  | HE-AI       | HE-RA | HE-LD | HE-AI                   | HE-RA | HE-LD |
| LCU-aligned, 64x64-LCU                     | 4.9         | 4.3   | 2.5   | 12.3                    | 8.4   | 5.6   |
| LCU-aligned, 32x32-LCU                     | 6.6         | 7.2   | 5.7   | 3.8                     | 3.0   | 2.7   |
| LCU-aligned, 16x16-LCU                     | 10.6        | 18.0  | 18.4  | 1.2                     | 1.5   | 1.6   |
| Leaf-CU-aligned                            | 5.3         | 4.5   | 2.6   | 2.0                     | 2.5   | 3.0   |

- The unified end-of-slice detection in JCTVC-E042 reportedly better than the 2-level end-of-slice signaling in JCTVC-D127

| BD-rate (%) | HE-AI | LC-AI | HE-RA | LC-RA | HE-LD | LC-LD |
|-------------|-------|-------|-------|-------|-------|-------|
| JCTVC-D127  | 5.3   | 5.8   | 4.6   | 4.4   | 2.7   | 2.5   |
| JCTVC-E042  | 5.3   | 5.8   | 4.5   | 4.4   | 2.6   | 2.5   |

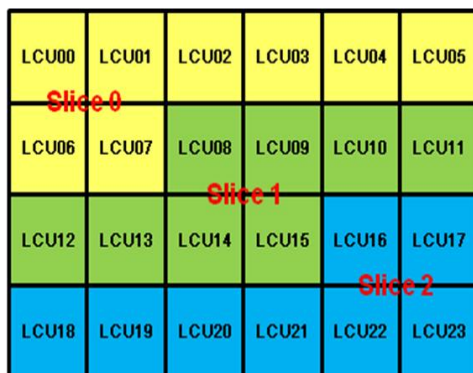
# Outlines

- Introduction
- Tested algorithms
- Simulation results
- Conclusions

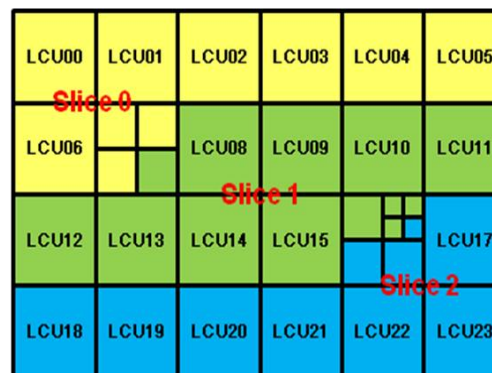
# Introduction

- In the current HEVC, one picture can be partitioned into multiple LCU-aligned slices
- In JCTVC-D127, it was proposed to use leaf-CU-aligned slices

## LCU-aligned slices



## Leaf-CU-aligned slices



# Tested Algorithms

- LCU-aligned slices

- Target number of bytes per slice is 1500
- Test different LCU sizes from 64x64 to 16x16
- Evaluate the impact of the LCU size on coding efficiency
- The bit rate inaccuracy is calculated for reference

$$inaccuracy(\%) = \left| \frac{(\text{Real coded bytes} - \text{Target bytes})}{\text{Target bytes}} \times 100 \right|$$

- Leaf-CU-aligned slices

- Target number of bytes per slice is 1500
- Test the 2-step end-of-slice signaling in JCTVC-D127
- Test the unified end-of-slice detection in JCTVC-E042, which was modified from JCTVC-D383
- Use BD-rate and bit rate inaccuracy for evaluation

# Simulation Results (1/2)

- LCU-aligned slices: HM-2.0-dev-slices (rev 609)
- Leaf-CU-aligned slices: MediaTek's software based on HM-2.0

| 1500 bytes per slice<br>Anchor: JCTVC-D600 | BD-rate (%) |       |       | Bit Rate Inaccuracy (%) |       |       |
|--|-------------|-------|-------|-------------------------|-------|-------|
|  | HE-AI       | HE-RA | HE-LD | HE-AI                   | HE-RA | HE-LD |
| LCU-aligned, 64x64-LCU                     | 4.9         | 4.3   | 2.5   | 12.3                    | 8.4   | 5.6   |
| LCU-aligned, 32x32-LCU                     | 6.6         | 7.2   | 5.7   | 3.8                     | 3.0   | 2.7   |
| LCU-aligned, 16x16-LCU                     | 10.6        | 18.0  | 18.4  | 1.2                     | 1.5   | 1.6   |
| Leaf-CU-aligned                            | 5.3         | 4.5   | 2.6   | 2.0                     | 2.5   | 3.0   |

- **Leaf-CU-aligned slices better than LCU-aligned slices**

# Simulation Results (2/2)

- MediaTek 's software based on HM 2.0
- Leaf-CU-aligned 1500-byte slices
- Anchor: JCTVC-D600
- Test the 2-step end-of-slice signaling in JCTVC-D127 and the unified end-of-slice detection in JCTVC-E042

| BD-rate (%) | HE-AI | LC-AI | HE-RA | LC-RA | HE-LD | LC-LD |
|-------------|-------|-------|-------|-------|-------|-------|
| JCTVC-D127  | 5.3   | 5.8   | 4.6   | 4.4   | 2.7   | 2.5   |
| JCTVC-E042  | 5.3   | 5.8   | 4.5   | 4.4   | 2.6   | 2.5   |

- The unified end-of-slice detection better than the 2-step end-of-slice signaling**

# Conclusions

- CE4 Subset1 experiments were conducted for both LCU-aligned and leaf-CU-aligned 1500-byte slices
- Suggest to adopt the leaf-CU-aligned slices for better coding efficiency and lower bit rate inaccuracy than the LCU-aligned slices
- Suggest to adopt the unified end-of-slice detection than the 2-step end-of-slice signaling due to better coding efficiency and lower design complexity





**Thank you**

