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Method and Syntax for Partial CU Merge

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Outline

- Review of partial CU merge in HM2.0

- Proposed method

- Experimental results

- Conclusions

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Partial CU Merge in HM2.0

- Force the 1st PU of an Nx2N or 2NxN CU to merge, excluding SCU
  - No merge_flag needed.

- The 2nd PU of an Nx2N or 2NxN CU can either merge or code
  - Merge_flag (ue(1)|ae(v))

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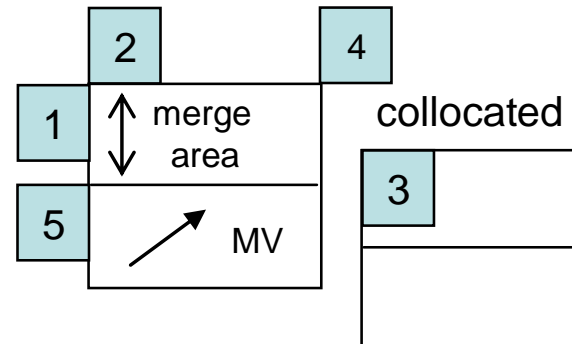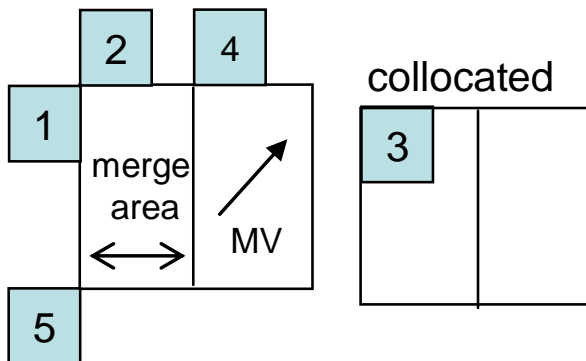
Proposed Partial CU Merge

- Also force the 2nd PU of an Nx2N or 2NxN CU to merge (i.e. both PUs are forced to merge in an Nx2N or 2NxN CU, CU>SCU)
  - No merge_flag needed.

- Reduce and re-arrange the merge candidates for the 2nd PU
  - Two merge candidates
    - One temporal candidate (if available) + one spatial candidate (2<3<4)
    - Two spatial candidates (2<3<4) if temporal candidate (1) is not available
  - Temporal_spatial_flag (ue(1)|ae(v))

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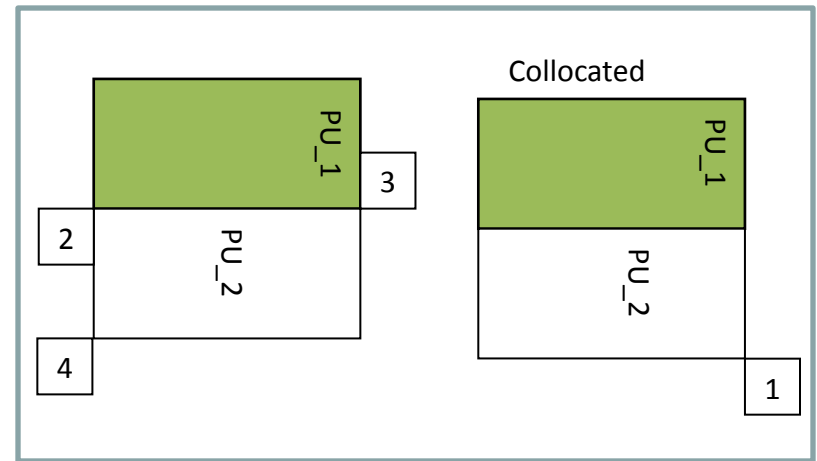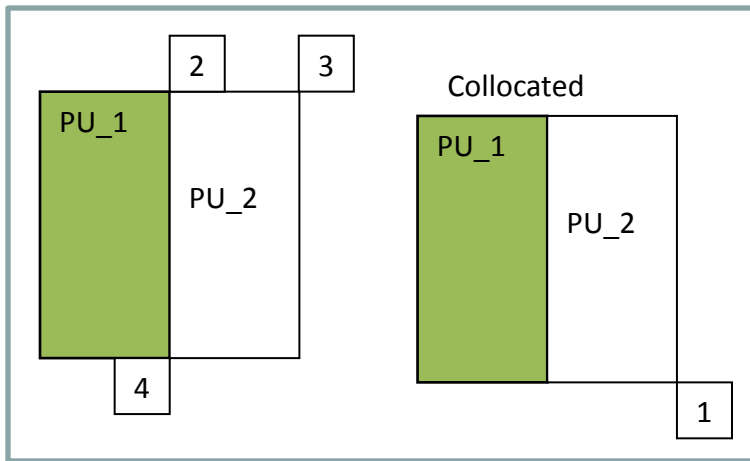
Result

	Random access mtk			Random access LoCo mtk		
	Y BD-rate	U BD-rate	V BD-rate	Y BD-rate	U BD-rate	V BD-rate
Class A	-0.1	0.2	-0.2	0.1	0.0	0.0
Class B	0.1	0.2	0.2	0.3	0.3	0.3
Class C	0.1	0.1	0.1	0.3	0.2	0.3
Class D	0.1	0.1	-0.1	0.2	0.2	0.1
Class E						
All	0.1	0.2	0.0	0.2	0.2	0.2
Enc Time[%]	88%			83%		
Dec Time[%]	101%			101%		

	Low delay			Low delay LoCo		
	Y BD-rate	U BD-rate	V BD-rate	Y BD-rate	U BD-rate	V BD-rate
Class A						
Class B	-0.1	0.2	0.2	0.3	0.3	0.4
Class C	0.1	0.3	0.2	0.3	0.2	0.0
Class D	0.2	0.4	0.2	0.4	0.1	0.3
Class E	-0.2	-0.7	0.1	0.3	0.0	0.5
All	0.0	0.1	0.2	0.3	0.1	0.3
Enc Time[%]	87%			81%		
Dec Time[%]	101%			101%		

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Conclusion

- Proposed a method for partial CU merge
  - Force the 2nd PU (i.e. both PUs) of an Nx2N or 2NxN CU to merge, when CU > SCU
    - No merge_flag needed for neither PU
  - Re-arrange merge candidates for the 2nd PU
    - One temporal (if available) from bottom-right neighbor
    - One spatial (or two if temporal is not available) chosen from top/left, top-right corner and bottom-left corner neighbors

- Encoding time reduction
  - RA/HE 88%, LD/HE 87%, RA/LC 83%, LD/LC 81%

- BD-rate increase
  - RA/HE 0.1%, LD/HE 0.0%, RA/LC 0.2%, LD/LC 0.3%

- No decoding time increase

- Recommend for adoption

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