



# AHG4: Avoiding Lower Left LCUs at Dependent Tile Column Boundaries

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8<sup>th</sup> JCT-VC Meeting in San José  
1–10 February, 2012

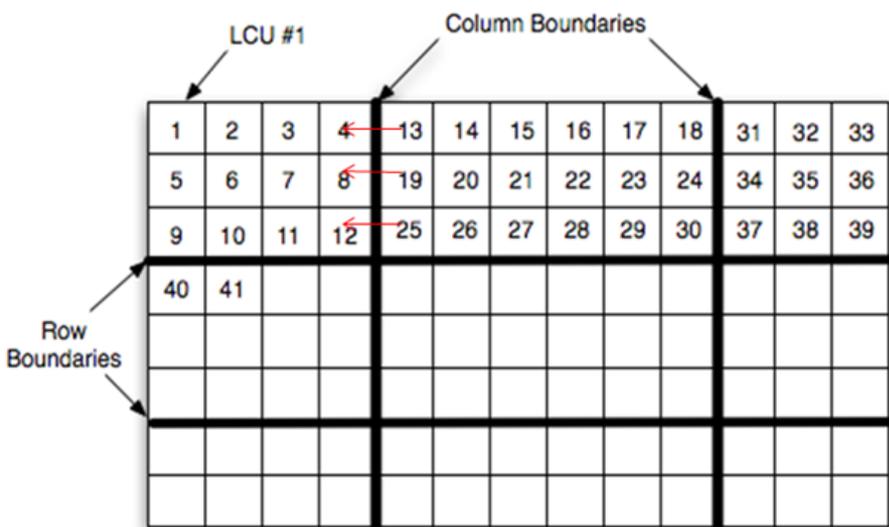
# Overall Summary

- In this contribution, we avoid using lower left LCUs at dependent tile column boundaries
  - Unify the availability check at tile column boundaries
  - Reduce processing latency
- The proposed constraint has been implemented in the latest HM as a bug (mismatch between HM and WD)
  - The bug is actually what we want!
- Only the WD has to be modified to match the HM
  - The HM bug report and associated software patch can be closed without action

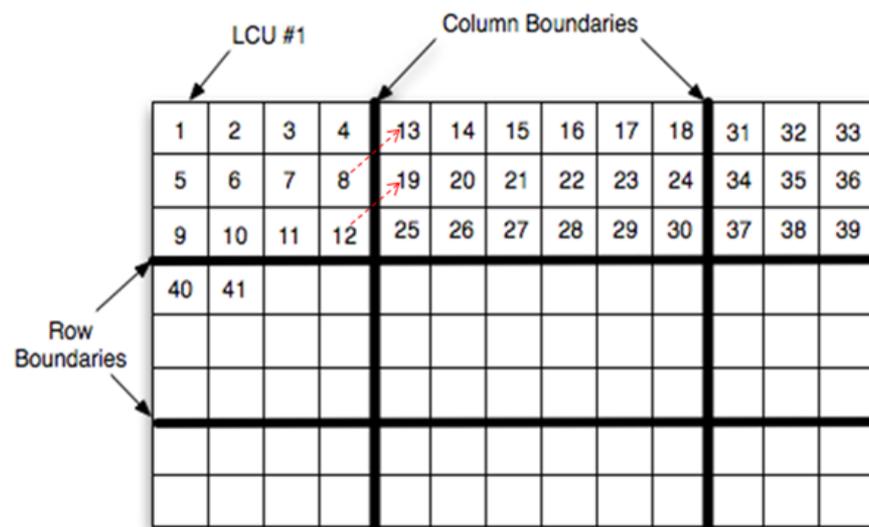
# Introduction

- In HM-5.0, dependent tiles effectively change of LCU scan order
  - Data from neighboring tiles may be used for encoding and decoding LCUs as long as the LCUs are available
    - Solid arrows indicate “available” and dashed-line arrows indicate “unavailable”

For left LCUs

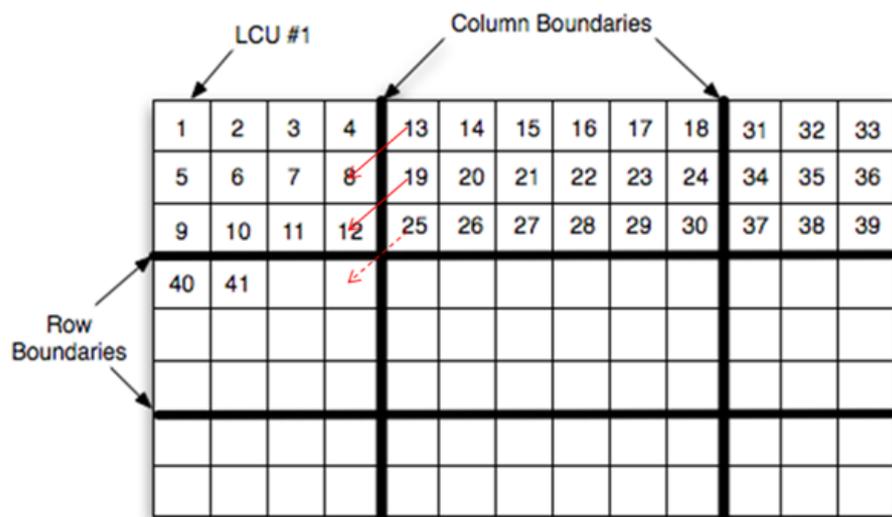


For upper right LCUs



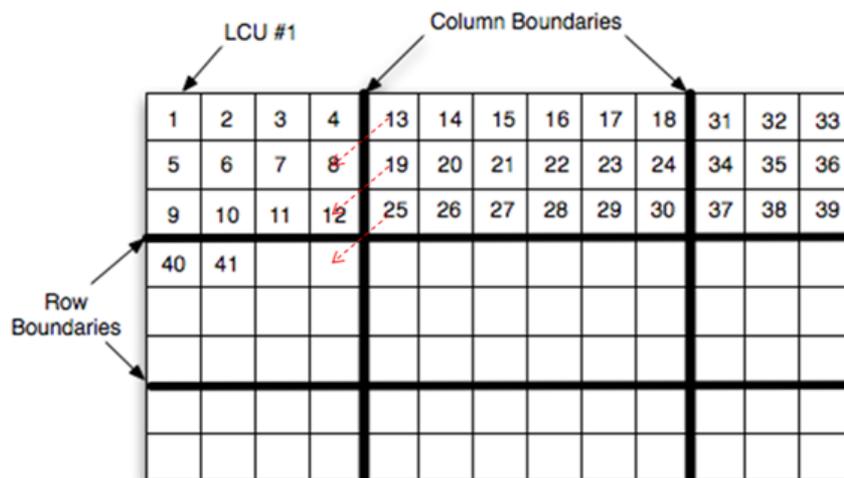
# Problem Definitions

- Lower left LCUs could be from a previous or future tile
  - The availabilities of lower left LCUs are different from LCU to LCU in the current tile at tile boundaries
- A current LCU may be dependent on its lower left LCU at a tile boundary
  - The processing latency of the non-first-column tile will be more than one LCU row
  - For example, LCU #13 of the 2<sup>nd</sup> tile cannot be processed until LCU #8 of the 1<sup>st</sup> tile on the 2<sup>nd</sup> LCU row is processed



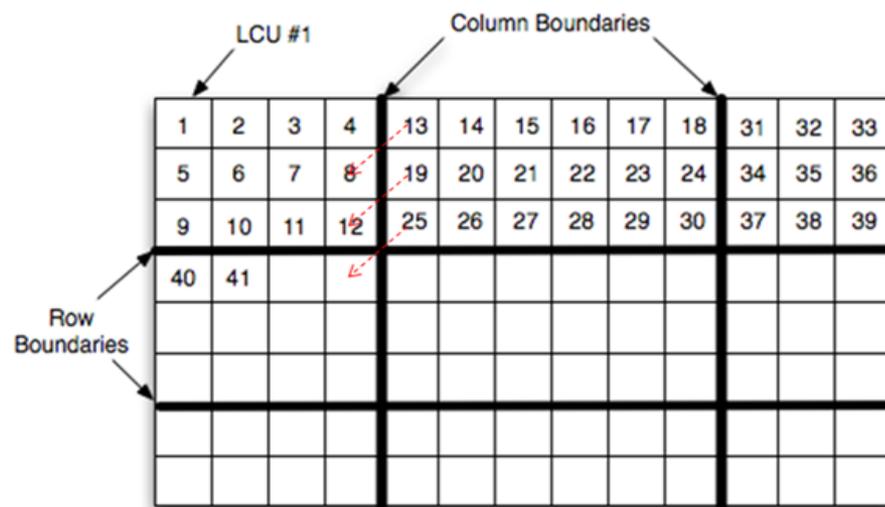
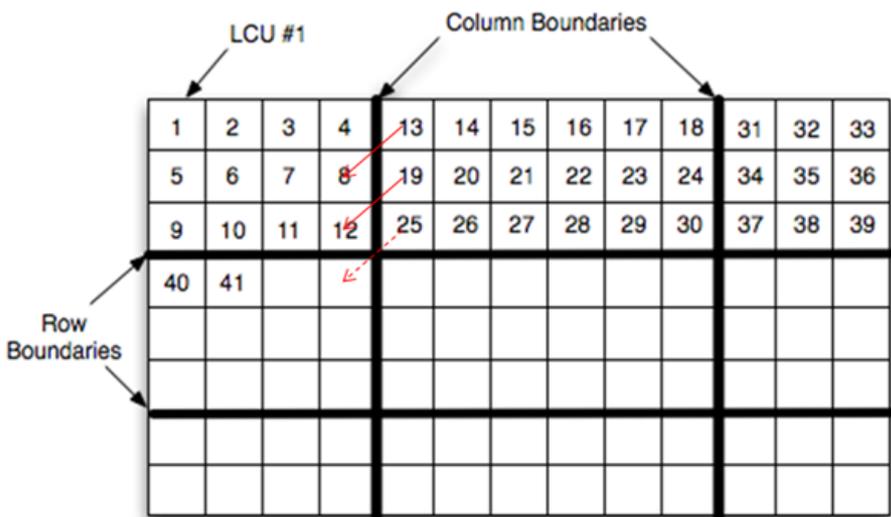
# Proposed Method

- For lower left LCUs from different tiles, we set all of them as unavailable
- The processing latency of non-first-column tiles can be reduced
  - For example, LCU #13 can be processed right after LCU #4 instead of LCU #8



# Mismatch between HM-5.0 and WD

- In current WD the left figure is specified, while in HM-5.0 the right figure is implemented
- What is implemented in HM-5.0 is what we want to propose in this contribution
- Therefore, we propose to modify the WD only



# Conclusions

- In this contribution, we propose a constraint on the availability of neighboring LCUs for dependent tiles
- LCUs to the lower left that lie in adjacent tiles shall be marked as unavailable
- The proposal requires the modification of the WD and a bug report to the HM closed without action