CoRE: Non-Linear 3D Sampling for Robust 360º Video Streaming

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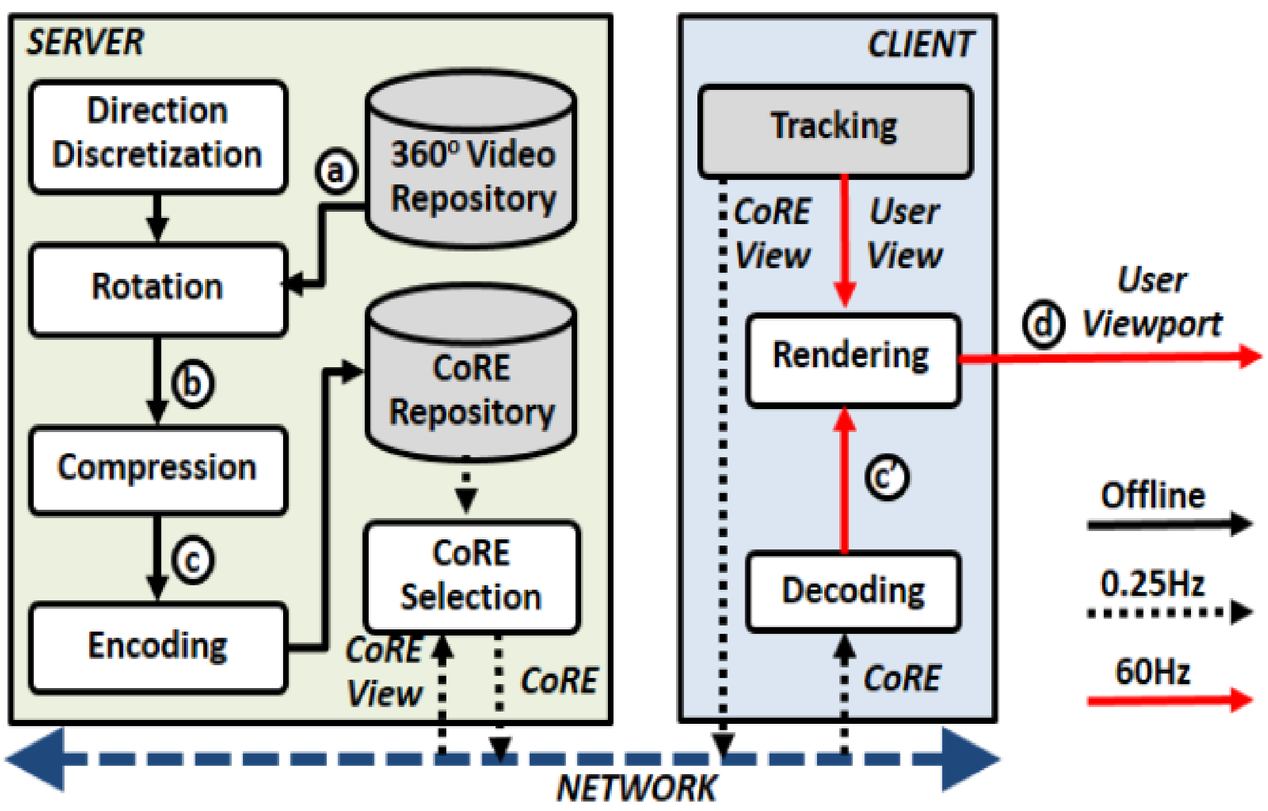
Problem: Streaming a 360º video wastes bandwidth and client processing power as only a fraction is actually seen.

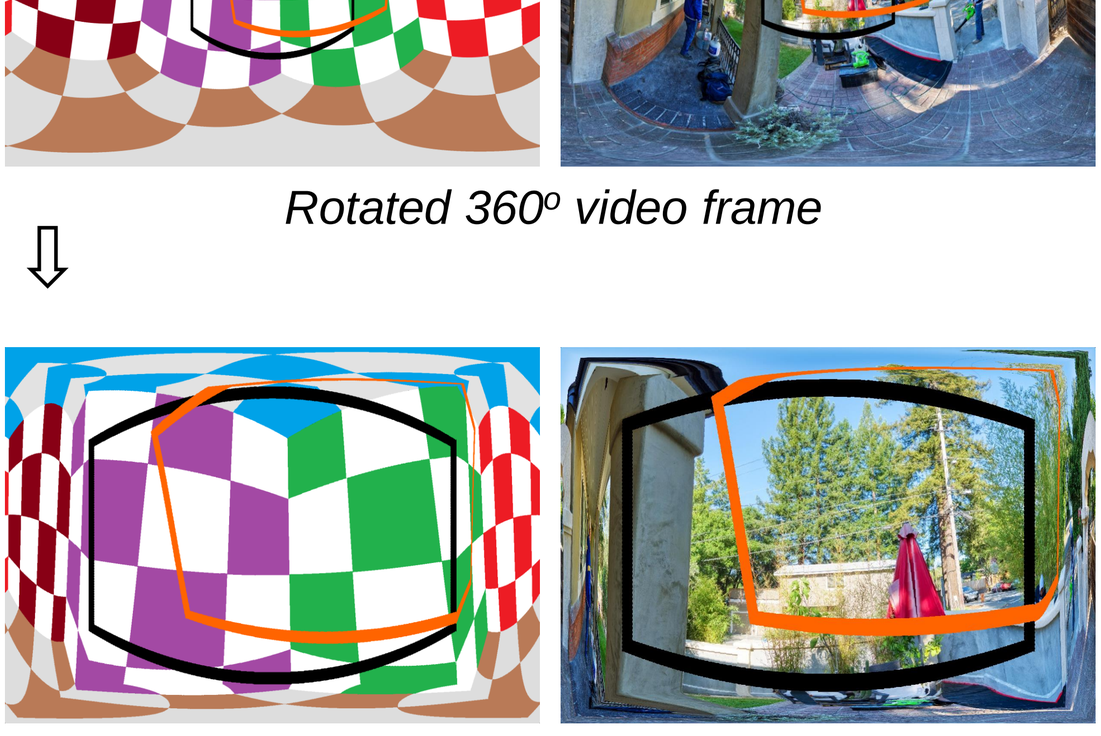
Current Approach: Tiling. Shortcomings: (1) compression inefficiency, (2) decoding overhead, (3) discontinuous frame quality, and (4) suboptimal frame partitioning.

Our Approach: *Compressed Rotated Equirectangular (CoRE) 360º videos*

- CoRE videos generated offline and stored on server.
- Client needs a single CoRE video file per time interval.
- CoRE video covers all view directions, but with decreasing resolution away from user view direction.
- CoRE video may cover further time points at decreasing frame rate.

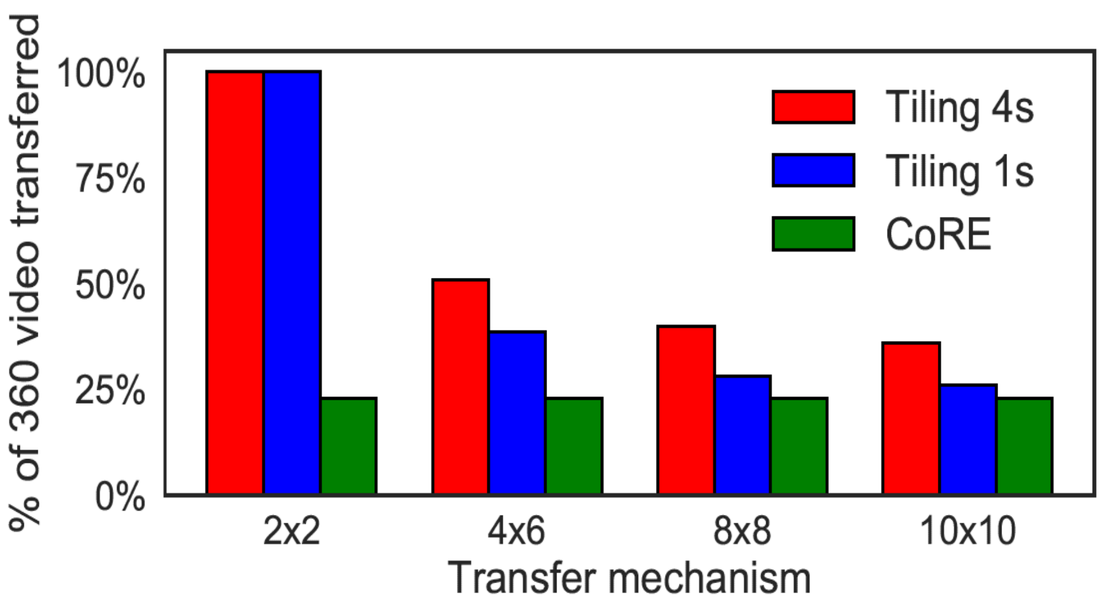


CoRE pipeline



Potential Advantages:

- Bandwidth efficiency
- Simplicity
- Robustness to view prediction imperfections
- No missing tiles; no abrupt resolution decreases
- Stall reduction when network jitter is high



Transferred data size: CoRE vs. tile-based systems

Left (original), middle (CoRE), and right (output) frames drawn to scale to show relative size

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