GPU LLC Management for 3D Scene Rendering
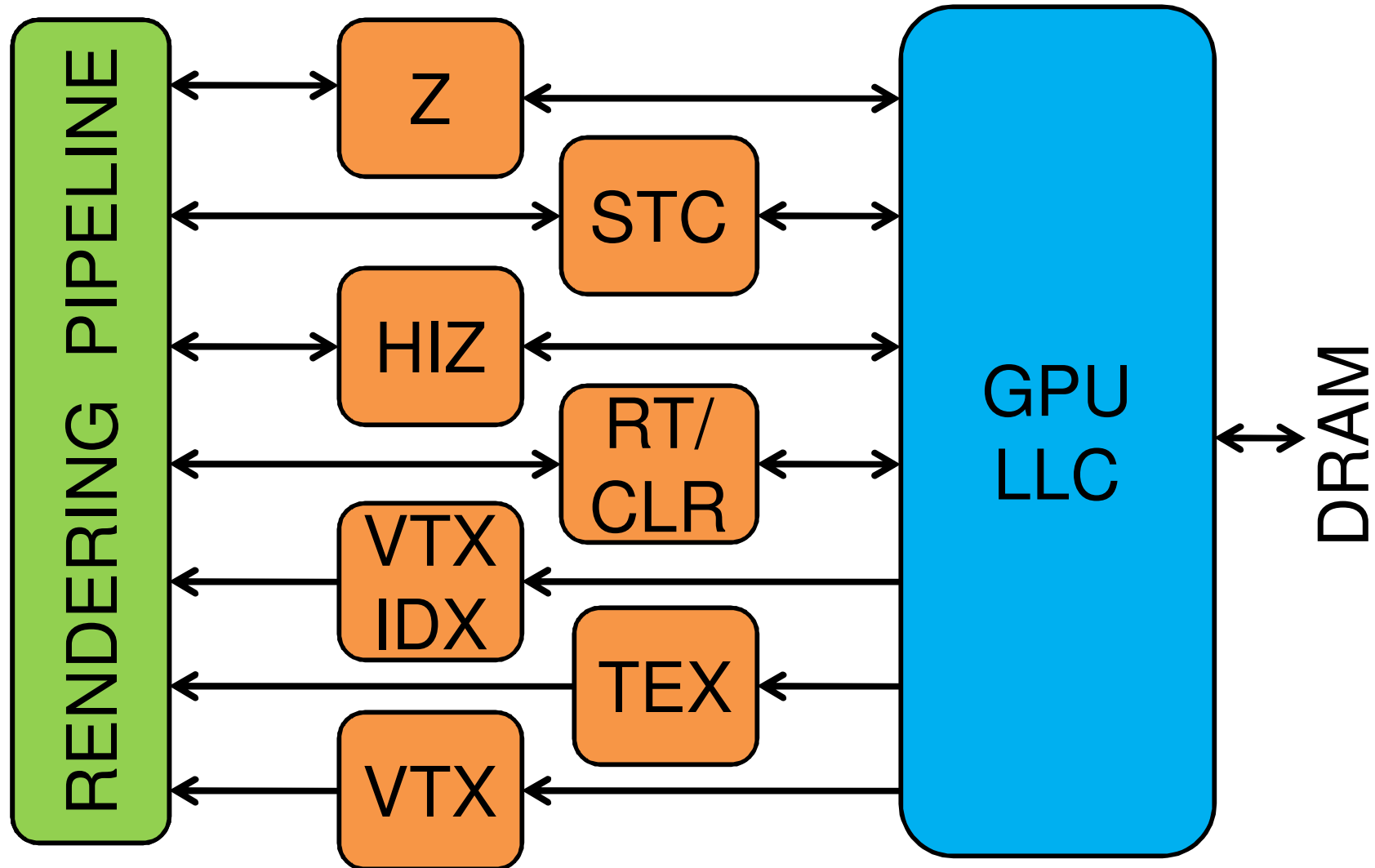
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GPU last-level cache interface

RENDERING PIPELINE

Z

STC

HIZ

RT/CLR

VTX IDX

TEX

VTX

GPU LLC

DRAM

Efficient management of the LLC shared between different 3D rendering streams

Solution approach and results

- Inter- and intra-stream reuses in LLC
  - RT, TEX, Z are dominant in the LLC traffic
  - Significant reuse from RT production to TEX consumption (render to texture)
  - Intra-stream reuses vary across streams

- Learn intra- and inter-stream dynamic reuse probabilities from sample sets and modulate insertion/promotion in other sets