Parallel In-Memory Evaluation of Spatial Joins

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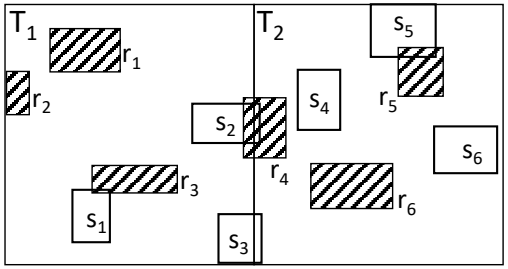
Spatial Joins

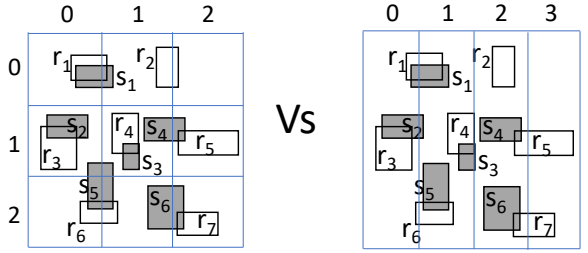
- Fundamental data operation
  - GIS, data analysis taks, scientific applications etc.
  - Find pairs of rivers and cities that intersect

Partition-based Evaluation

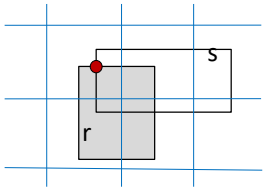
- PBSM [Patel and DeWitt 1996]
  - ✓ Multi-assignment, single-join (MASJ)
  - ✓ One independent join task per partition
  - ✓ Suitable for dynamic data, no preprocessing
  - ✓ Simple, easy to implement
  - ✓ Adopted by all distributed spatial DMS



- Challenges
  - In-memory evaluation
  - Type and number of partitions



  - Handing duplicates



  - Selecting sweeping axis
  - Parallel processing on multi-core CPUs