

Distributed Index for Multi-dimensional data in sensor networks

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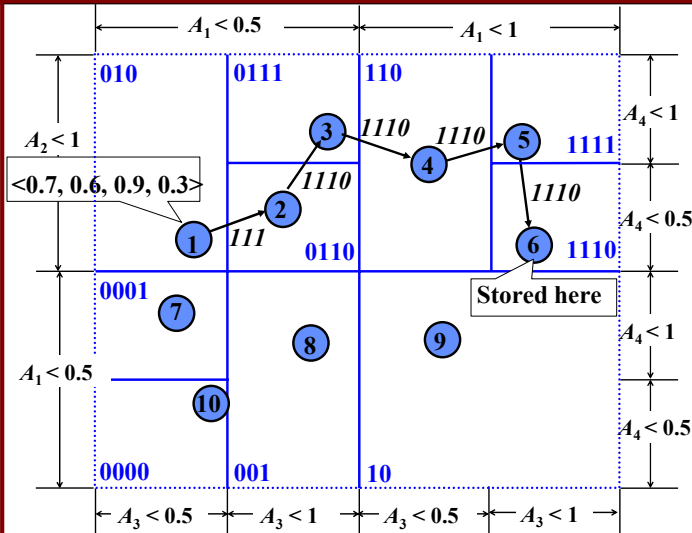
DIM's Motivation

- Provides support for multi-dimensional range queries in sensor networks when in network storage is applied.
 - e.g. List all events whose temperature lies between 70 and 80 and whose light levels are between 10 and 15.
- Can be used for searching and correlating events of interests with multiple attributes.
- Classical approaches in traditional databases — Indices.
- But here we need a distributed index which works with bins that are scattered all over the network.

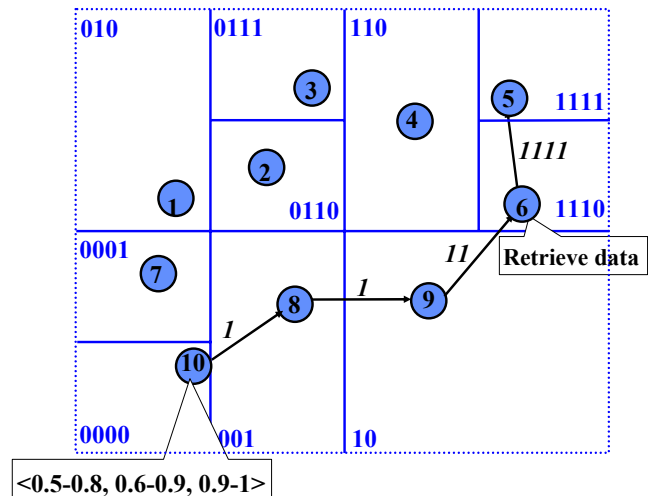
DIM's components

- A virtual index tree that covers the entire network.
- A network partition jointly built by all nodes in a recursive and distributed way.
 - A allocation scheme that assigns each node to a bin.
 - DIM calls each bin a *zone*.
- A hash function that maps data and queries to bins.
 - DIM maps each data tuple to a single zone.
 - DIM maps each query to one or multiple zones depending on the ranges of the query.
- A geographic routing that delivers data and queries to bins.

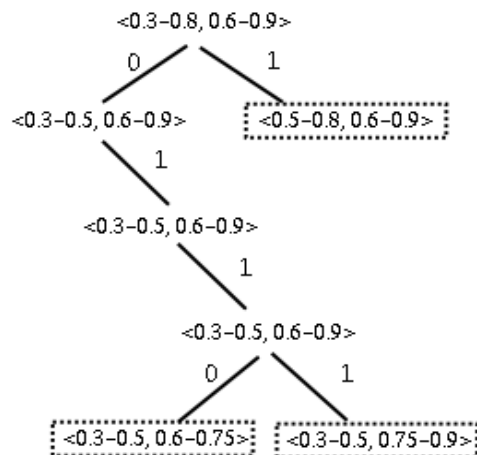
Data Insertion



Query Propagation



Query Splitting



DIM's Mote Architecture

