



CISTER - Research Center in
Real-Time & Embedded Computing Systems

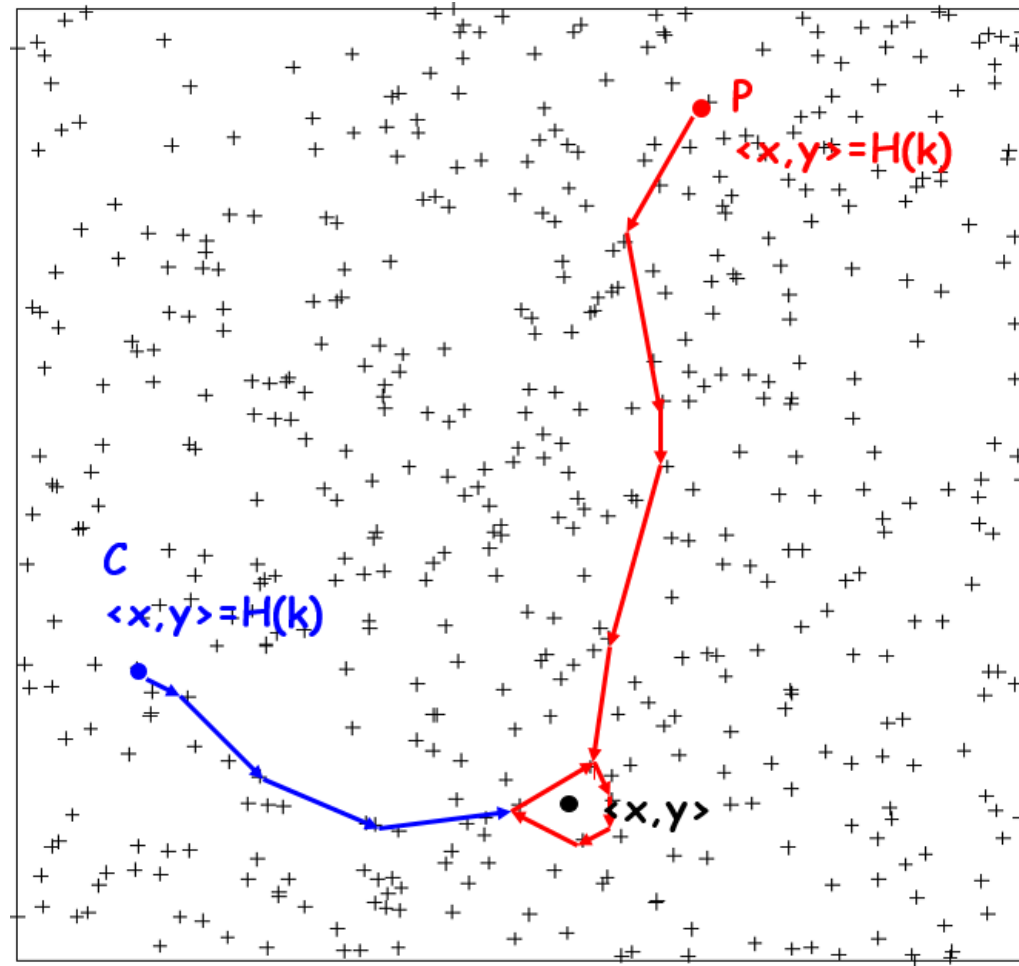
A module for Data Centric Storage in ns-3

Michele Albano, Tiago Cerqueira, Stefano Chessa



Data Centric Storage

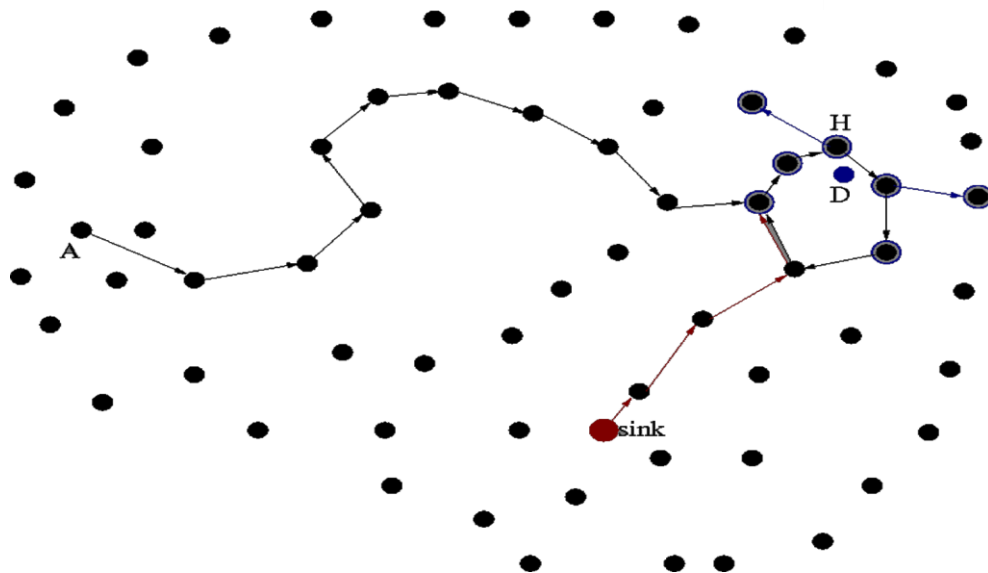
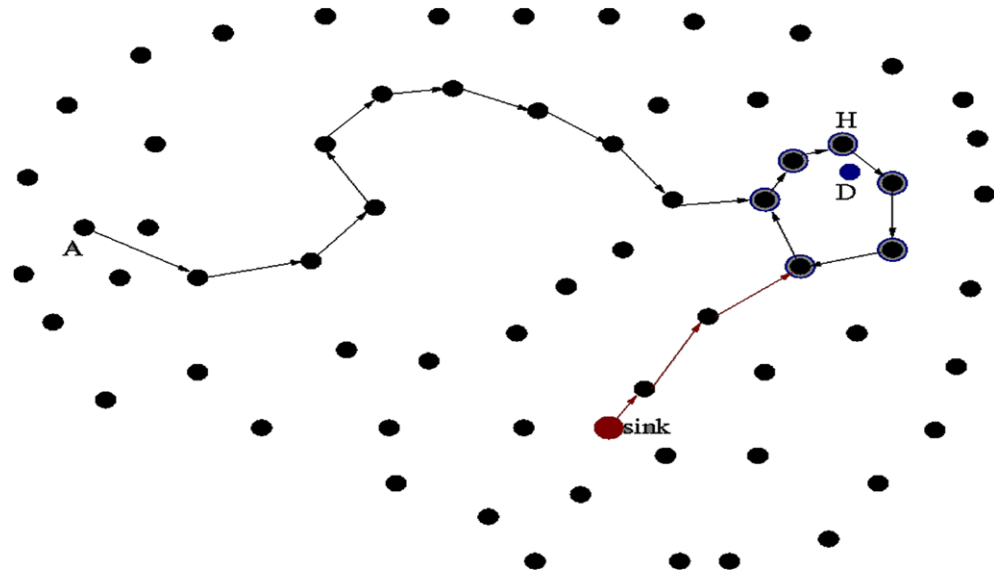
- Storage of data on the sensors can contribute to saving sensors' communication energy
- Each datum is identified by a key
- Position of datum is a hash function of key: $\langle x,y \rangle = H(k)$
- Data is routed using *GPSR*: greedy steps, and perimeter mode when no neighbour is closer to destination
- Producer (P) sends data to point $\langle x,y \rangle$
- Data are replicated on all nodes in the perimeter around $\langle x,y \rangle$
- To retrieve data regarding k, a consumer (C) sends a request to $\langle x,y \rangle = H(k)$
- When datum is found it is returned to C



GHT vs Q-NiGHT

Geographical Hash Tables (GHT):

- Data is stored on the whole perimeter around $\langle x,y \rangle = H(k)$
- No control on the number of sensors saving the data



Q-NiGHT:

- Data is stored on the v sensors closest to $\langle x,y \rangle = H(k)$
- Direct control on the QoS (number of sensors storing data)
- Proven to save energy w.r.t. GHT

Features of the DCS module

- Routing using the **Enhanced GPSR** protocol:
 - Greedy steps as long as it steps forward
 - Perimeter mode to get around holes/store data in GHT
 - Heuristics to decide to go clockwise / counter-clockwise
- **Data Centric Storage** using
 - GHT
 - Q-NiGHT
- Implemented as an **Application** layer
 - Since it is the port of a ns-2 Agent
- Basic visualizer
 - Written in c#, not part of ns-3

