A module for Data Centric Storage in ns-3

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ABSTRACT

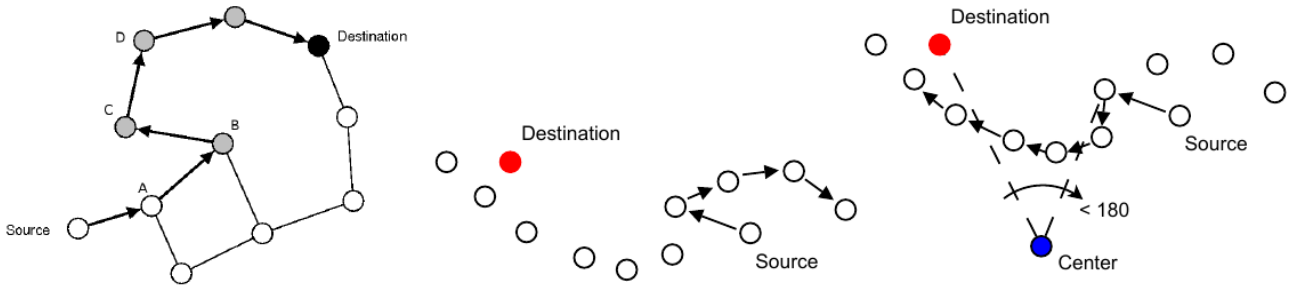
Management of data in large wireless sensor networks presents many hurdles, mainly caused by the limited energy available to the sensors, and by the limited knowledge of the sensors regarding the topology of the network. The first problem has been targeted by the introduction of in-network storage of sensed data, which can save much communication energy. The second issue found some relief with the introduction of geographical protocols that do not need knowledge regarding the network at large. Data Centric Storage systems such as Q-NiGHT [1][2] assume that each sensor knows its own geographical location, and they use geographical routing such as the Enhanced Greedy Perimeter Stateless Routing (EGPSR) protocol, sketched in Figure 1, to deliver packets to the sensor closest to a given point in the sensing area.

We are implementing a module for the execution of the EGPSR protocol, and for the execution of storage and retrieval operations using both Q-NiGHT and the original DCS-GHT approach. The simulator is currently able to perform all the operations involved. All operations are currently executed in the application layer of the architecture.

We propose a demo regarding geographical routing and data centric storage. We will show how to configure the simulator, how to run it, and we will give an overview of the code. After the execution of the simulator, we will use a custom visualizer to show the execution of store and retrieve operations in the network, and the routes taken by the packets. Finally, we will present statistics regarding node utilization both in terms of memory and execution of communication primitives.

The code of the simulator module will be delivered for the NS-3 review by the end of the summer. By the end of April 2015, the current state of the code will be available on:

https://bitbucket.org/micheleISEP/qnight-ns3



(a) Greedy mode and perimeter mode (b) Standard perimeter mode (c) Enhanced GPSR strategy

Figure 1 Geographical routing with Enhanced GPSR

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