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ANA: Ad-hoc Nerve Addressing: Addressing in sensor networks has been left aside in current research. Most set up protocols have decided to assign random, probabilistically non-colliding, addresses to the nodes.

The address of a node is used for various purposes, namely to uniquely identify a node. In sensor networks, where nodes can loose individuality the scope of this unique identification can many times be reduced to one or two hop neighbors. Globally unique addresses for sensor networks are required for some tasks. We haven't yet established if the lack of point to point communications requiring unique addresses is due to the nature of sensor networks or to the lack of applications so far. The former seems to be the case but further proof is required.

We have also used addresses, and their structure, to aid us in routing. A clear example is how we used CIDR to minimize routing table entries. A completely random distribution of node addresses would make it impossible for the Internet to function since core routers wouldn't have enough resources to handle communication between two arbitrary nodes.

This work studies node address assignment in sensor networks and proposes ANA: Ad-hoc Nerve Addressing. We take advantage of the characteristics that define a sensor network and some of its possible scenarios. We consider sensor networks to be made up of mostly identical nodes, randomly deployed in a field communicating via wireless links. The objective is to devise an addressing strategy that will help with routing and energy conservation. Our main scenario deals with data gathering, either some form of environmental monitoring or specific events.

A principal data collector site, called the Central Nerve (CN), is the main point of communication of the sensor network. It can be though of as the most important node since it's the one that processes the information; relays it to the outside; or stores it. For example, in a planetary exploration the Central Nerve might be a major “lander” with antennas, relaying the information to a satellite.

Under this scenario, we expect most communication to originate or terminate at the Central Nerve, hence, we have developed an addressing scheme that is centered around it. Addressing nodes around other nodes is definitely not a new idea. Landmark routing is a clear base for our concepts as are similar wireless efforts.

Some of the things we consider and discuss include the traffic patterns (from CN, to CN, other), network dynamics (no mobility, low change), error conditions (node failure, packet drops), energy conservation, address length (fixed, dynamic), etc. We do not deal with security or MACs and we touch multicast only briefly.

We conclude with a description of the scenarios where ANA might be useful and what needs to be improved.