

## Network Exploration

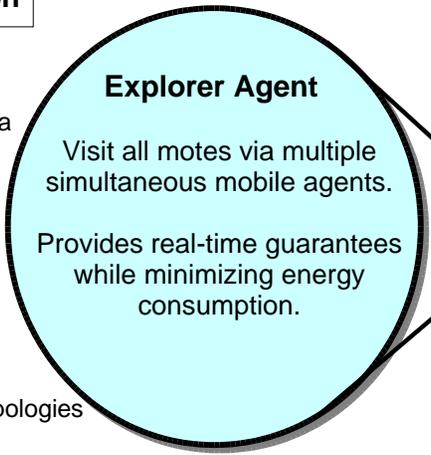
### Two-Step Algorithm

#### 1. Route Preplanning by a genetic algorithm:

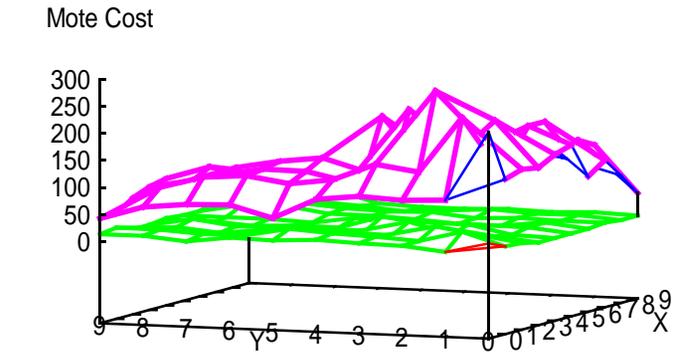
- Server decides:
- Number of mobile agents
  - basic itineraries of each agent

#### 2. In-Network Localized Decisions:

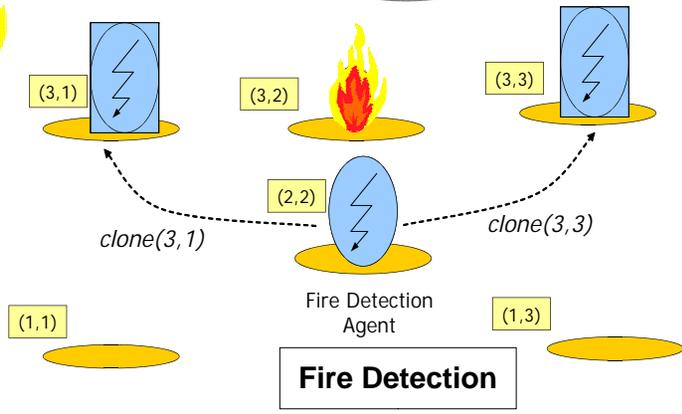
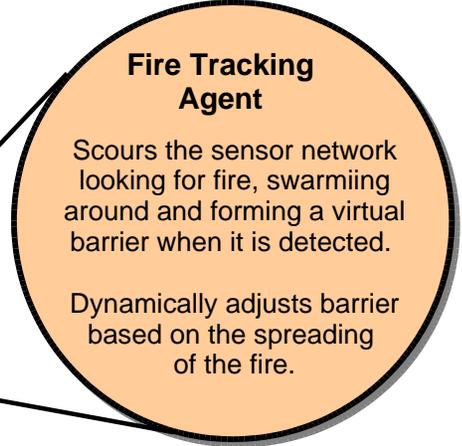
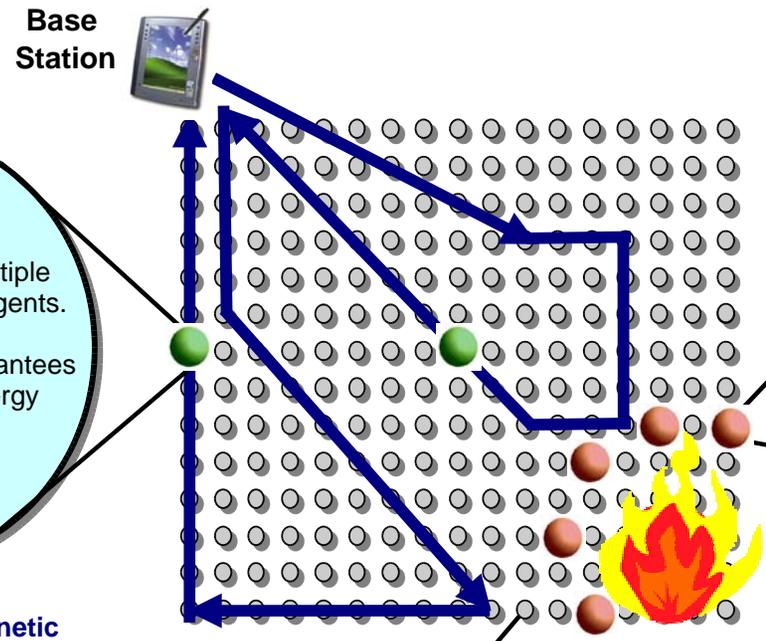
- Mobile agents adapt to
- unexpected network topologies
  - node failures



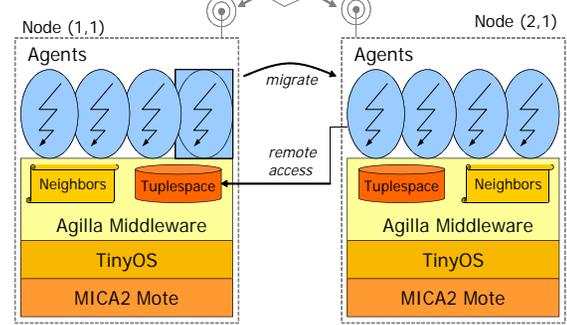
### Individual Mote Cost (Energy-Wise) of the Genetic Algorithm Best and Worst Solutions



Best implies smaller and more balanced individual cost



- Upon detecting fire, the fire tracking agent clones itself to all neighbors within a distance of 1.5 of the fire forming a barrier.
- Agents continuously monitor temperature and jump away when it gets too hot, and jumps towards the flames when it gets too cold, thus forming a **dynamic barrier**.



Agilla

- Agents are written in a higher-level language; simplifies programming
- Agents can be dynamically injected into an existing network
- Agents can move or clone onto any node addressed by **location**
- Inter-agent coordination and context discovery done through **tuplespaces**

**Wireless Sensor Networks**  
Ubiquitous and Large  
Resource-constraint  
Faulty

**Mobile Agents**  
Flexibility  
Robustness  
Load Distribution