2/1/05 CSE 494/598

Specifying a distributed protocol: event-driven

Roles / Set of Action.

Eg:

If I am cluster head then:

Event: Action

(If I recv. a TREE_Construct msg: __________)

( hop_count, own_id )

local_hop_count = hop_count;

1. /* Update local hop count */

2. Send a message to neighbor:

TREE_CONSTRUCT ( hop_count+1, 

own_id )

Examples of Events:

1) Receiving a message of a given type

2) Time out
Energy Saviy Techniques.

1) Multihop Routing
2) Data Aggregation - Compression
3) Power Control - reducing or adjusting the transmission power so as to not waste energy in transmitting a packet "longer" than needed.

\[ \Delta \rightarrow \Delta \rightarrow \Delta \]

Fixed set of power levels.
\[ \{ P_1, P_2, \ldots, P_{\text{max}} \} \]

Binary search on to determine the right power level.
Purpose of waking up:
- to see what's going on while the nodes were "sleeping" thus sensed some data which now needs to be transmitted.
- make sure "my parent" or forwarding node is awake when I transmit the packet.

informing the receiving node that I have a packet for you.
4) Sleep Scheduling:
   - "Switch off transceiver"
   How does scheduling work without a distributed clock?
   - Time synchronization
     NTP: Client - Server (NIS)
   - Elson & Estrin on Local Time Sync.
     • Broadcast event: tick
     • Receivers:

\[ \frac{t_W}{t_W + t_S} \]

Time is very low.
Dual-radio Scheduling:

Two radios:
- High-power: used for (data channel) data communication
- Low-power: used for (control channel) waking up high-power radio.