CSE 461 - Module 7D: MAC Layer Part 4

RFID (EPC Gen 2): Overview

- RFID usage/goals
- RFIDs must be cheap
 - Very limited processing and storage
 - Contain Electronic Product Code (EPC)
 - Contain Selected and Inventoried bits
 - Carry no power (battery)
 - Use backscatter transmission

(www.maxxamv.com) (http://fab.cba.mit.edu/classes/MIT/863.08/people/nadya/week1.html)



Reading RFIDs

- Reader sends commands; all RFIDs in range execute them
- Result of executing command may depend on RFID-local state
- Goal: isolate one RFID tag from all the rest
 - At that point you can operate on it alone
 - Until that point, all you're getting back are collisions
- Reader commands:
 - Select select yourself based on some memory bits
 - Query ask for response based on either memory bits or result of picking a random number
 - ACK I heard you, please provide your EPC



RFID Collision Resolution

- Protocol supports two basic mechanisms
 - Protocol does not say how to use those mechanisms
- 1st mechanism: coin toss
 - Query command specifies a parameter Q
 - RFID picks a number U[0,2^Q]
 - RFID responds if it picked 0
 - Specification shows a strawman implementation that uses binary exponential backoff
 - 2nd mechanism: tree walk
 - Query command specifies a bit mask
 - RFID responds if its memory (at some starting location) matches the mask
 - Example: walk the tree formed by possible EPC values
 - "Anyone whose EPC starts with a 0, respond"
 - Collision
 - "Anyone whose EPC starts 00, respond"
 - Collision
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