**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
            - ....