

**Lecture 32 case study**  
**1.264 Fall 2013**

1. RFID inventory scans

A warehouse scans its inventory with RFID readers that read every item every 15 minutes. There are 100,000 items in inventory. The sweep takes one minute to complete, so the data is bursty. The data is sent to the data center 3 km away as it is read. Each RFID tag transmits 256 bits of information, and is read four times per sweep (either by different readers or multiple times by the same reader). **TCP/IP and HTTP headers double the size of the data.**

- a. What is the total bandwidth required?
- b. Would 10 Mbps Ethernet work?
- c. Would 100 Mbps Ethernet work?
- d. Would cellular 500 kbps link work?
- e. Maximum Ethernet copper cable length is 100 meters.
  - How would you connect points 3 kilometers apart if you have right of way?
  - Don't have right of way?

2. Enterprise telecom networks

- a. Why do we bother with wired telecommunications?
  - Why not use wireless everywhere?
- b. Why do companies design and manage their own networks?
  - Local area network
  - Wide area network
- c. When do companies build their own network, versus lease facilities, versus buy a carrier solution? Why? For each company in the list below, indicate whether you think they build their own network, lease facilities, or buy a carrier solution. Consider whether they have right of way available, their scale, and other issues that you feel are important.
  - MBTA
  - Union Pacific Railroad
  - MIT Federal Credit Union
  - Bertucci's Pizza
  - Citibank
  - NBC
  - American Airlines

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