What does the future behold?

Athula Balachandran
What were the goals?

- The Internet was designed to share resources.
  - Host identifier
  - Point to point communication
- Will this stay forever?
Today

• As of December 2008, the Internet was moving 8 Exabytes/month

• 180 Exabytes of new content was created in 2006

(Andrew Odlyzko, UMN, Minnesota Internet Traffic Studies (MINTS))
So what's wrong?

- Fundamental mismatch
  - Most users/applications care about “what”
  - Network operates around “who”
- Other issues
  - Support for mobility
  - Accountability
  - Support for evolution
Future Internet Architecture

• Named Data Networking
  • Content, content, content!
• Mobility First
  • Mobility as the norm and not the exception.
• NEBULA
  • Cloud computing centric architecture.
• XIA (eXpressive Internet Architecture)
  • Accommodating future entities.
Content Centric Networks

- Devices express interest in a particular data.
- Any device with that particular data can respond with the content.
Some things to think about

• Challenges
  • Naming
  • Integrity and security
  • Locality

• For your project we had simplifying assumptions
  • But to have a real world network architecture, these issues need to be addressed in a scalable fashion.
Future in 15-441?

- Project 3
  - Bittorrent like file transfer application
  - Implement reliability, congestion control (like TCP) over UDP
TTL based next hop discovery.

- Cool hack!
- Piggy backing on TTL.
  - Assumption: TTL is set to 32.
- Works perfectly fine except when there are node failures.
  - LSA timeouts!
- If you are using Dijkstra's it can be as simple as BFS.
Any questions regarding timeouts?
Questions?