

Computer Networks: Motivation

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Interconnect
Computer networks

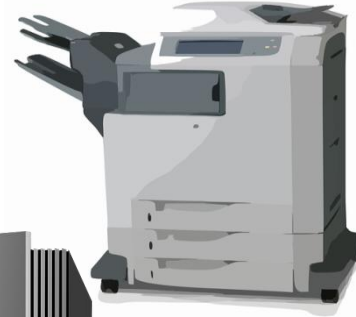
Internet Services

- Communication: Email, Chat, Voice/Video (Skype)
- Entertainment: Online gaming, Videos (Youtube), Blogs, Social networks (Facebook, twitter)
- Education: Wikis, News, MOOCs (Coursera, edX)
- Finance/Commerce: Online shopping (Amazon, ebay), Banking



Business Usage

- Make data, programs and equipment available irrespective of physical location
 - Customer/Employee records, inventory, financial statements etc
 - Custom software, Security software etc
 - Share printers, scanners
- E-commerce based companies (Amazon, EBay, Flipkart etc)



amazon.com

ebay

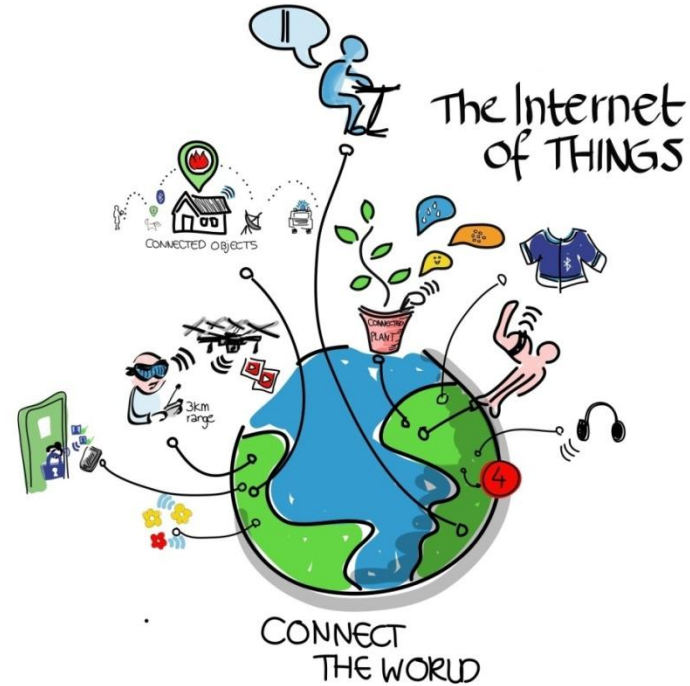


Information Age

- Internet: Communication network for information exchange
 - Personal (Social, News, Shopping, Entertainment)
 - Business (Online customer support, Databases, Teleconferences, Collaborative software development etc)
- Wireless Network: Networking on the move
 - Freedom from wires: **Anytime Anywhere Communication**
 - Cellular/Wifi access, Satellite TV, GPS (maps, location) etc

Out of ordinary/Futuristic Usage

- Internet of Things:
 - Connect smart objects to Internet (Smart grid, home automation, Intelligent transport, Healthcare etc)
- Near Field Communication:
 - Google wallet, Smart poster
- Interplanetary Internet



Impact

As of June 2015

- 3B (billion) Internet users (40% of population)
 - India: 243M (million; 19% of population)
- 2M emails sent in 1 sec (67% of it is spam)
- A little under 1B websites
- 1 Lakh videos watched per sec at YouTube
- 1B Facebook users
- 50k Google searches in 1 sec

Ref: <http://www.internetlivestats.com/>

What does all this mean?

- High dependency and demand
 - Job Market: Plenty of job opportunities
 - Exciting Area: Plenty of scope for innovation
 - Basic Knowledge: Helps understand/debug networks
 - Earn brownie points from friends/family

Goals of the Course

1. Appreciate the challenges posed by wired communication
2. Understand how some of the challenges are overcome at the different layers of the protocol stack
3. In the process, explore/familiarize with a few popular standards/protocols (e.g. Ethernet, IPv4, TCP, HTTP)
4. Implement/experiment some of the ideas (in the form of projects/labs)
5. Get a high level overview of ongoing research/hot topics in this space

Summary

- Information age
- High dependence on computer networks
 - Personal or business front
 - Has seen tremendous growth and growth expected to continue
 - Useful to understand how it works