# CE3005 Computer Networks

Lecture 1
Course Logistics and Internet History

# The Disappearing President's Office

Before

After

# Contents

- **Course Logistics**
  - Teaching staff
  - Lecture
  - Tutorial
  - Lab
  - Exam
- **A Brief History of Internet**
  - How this thing gets started

# Course Logistics

Teaching Philosophy

# TEACH LESS, LEARN MORE

# Teaching Staff

- **Lecturers**
  - Dr. Yonggang Wen (Part I)
  - Dr. Francis Lee (Part II)
- **Teaching Assistants**
  - Hu Weizheng

Yonggang Wen

Francis Lee

# Lecture

- **Time/Location**
  - Wed, 08:30-10:30, LT5 (☺)
- **Two Parts**
  - Part I: week 1-6 (Yonggang Wen)
  - E-Learning: week 7
  - Part II: week 8-13 (Francis Lee)


- **References**
  - James K. Kurose and Keith W. Ross, *Computer Networking – A Top-Down Approach* (CN)
  - Douglas E. Comer, *Computer Networks and Internets* (CNI)

# CE3005 - Part I

- **Focusing on Underlying Layers**
  - Physical layer resilience
  - Data link layer
    - Flow/Error control
    - HDLC
  - Local area network
    - MAC
    - Wireless LAN
  - Network architecture and performance
    - Network design patterns
    - Queuing theory

# Part I Syllabus – Fundamental Underlying Layers

| Lecture | Date | Subject |
|---|---|---|
| 1 | 10/08/2016 | Introduction |
| 2 | 10/08/2016 | Network layer & physical resilience |
| 3 | 17/08/2016 | Data link layer – flow control |
| 4 | 17/08/2016 | Data link layer – error control |
| 5 | 24/08/2016 | Data link layer – HDLC |
| 6 | 24/08/2016 | Local area network – introduction |
| 7 | 31/08/2016 | Local area network – MAC |
| 8 | 31/08/2016 | Local area network – Ethernet |
| 9 | 07/09/2016 | Local area network – WLAN |
| 10 | 07/09/2016 | Packet switch network |
| 11 | 14/09/2016 | Network performance analysis |
| 12 | 14/09/2016 | Review and examples |

# CE3005/CPE302 – Part II

- **Covering Higher-Level Layers**
  - Applications
  - TCP protocol
  - IP protocol (main emphasis)
  - Routing process

# Tutorial

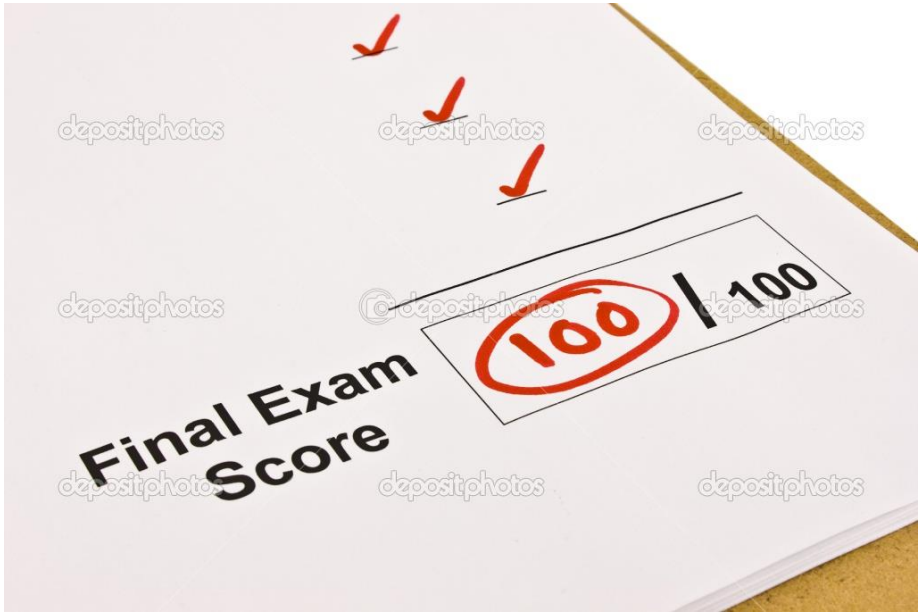
- **Starting from the 3rd week**
  - Try all the problems before the session
- **7 Tutorials**
  - 6 for regular sessions
  - 1 for E-learning
- **Problems & Questions**
  - Exam questions from previous years
  - Problems asked by you

# Lab

- **Lab**
  - Hardware Lab 1 (N4-01A-03)
  - Starting from 5th week
  - Check your schedule on lab front door ASAP
- **CE3005 (3AU)**
  - 3 Lab experiments
  - AWS cloud-based lab (NEW)

# Exam/Grade

- **No mid-term exam**
- **One final exam (2 hours)**
- **Score= Coursework (~30%) + Exam (~70%)**

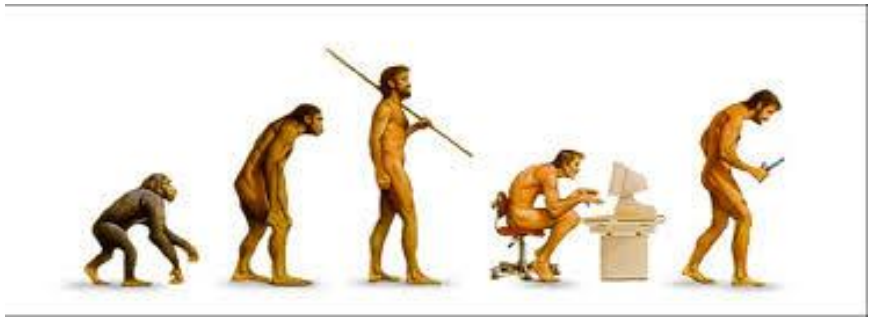


# How to ACE CE3005

- **Attend Tutorial**
- **Attend Lab**
- **Attend Lectures**


- **Keep your eyes open**
- **Keep your ears open**
- **Ask questions**
  - You just talked about …, I am confused about …, can you explain again about …?

# History of Internet



# What is the Internet?

- WWW
- ftp
- telnet
- Email
- MSN/Skype
- P2P
- ……

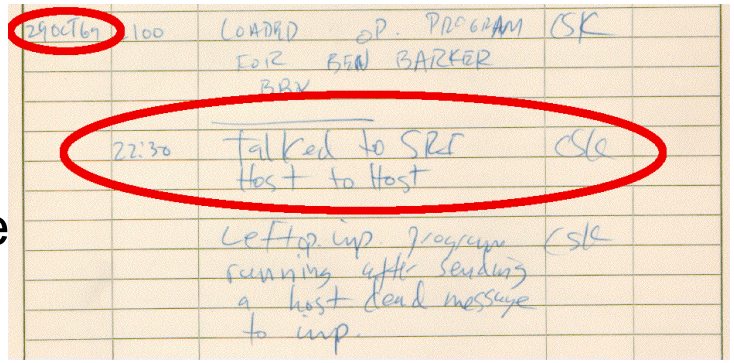




An inter-connected infrastructure for information exchanging via standard protocols

# Where Did It Come From?

- **Early 1960's - DARPA (ARPA in 1960's) project headed by Licklider**
- **Late 1960's - ARPANET & research on packet switching by Lawrence Roberts**
  - 09/02/1969 – Leonard Kleinrock's computer at UCLA became first node on the ARPANET
  - 29/10/1969 – First packets sent; Charlie Kline attempted use of remote login from UCLA to SRI; system crashed as "G" in entered
  - 1969 - Four nodes: UCLA, SRI, UCSB, University of Utah

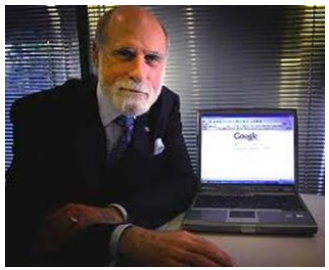




Get more info at:
http://www.isoc.org/internet/history/
http://www.packet.cc/internet.html

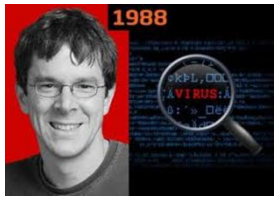
# History of Internet

- **1969 – First RFCs by Steve Crocker (http://rfc.sunsite.dk/)**
- **1971 – Email by Ray Tomlinson @ BBN**
- **1970's – Protocol development**
  - 1972-1974 TCP/IP developed by Vint Cerf & Bob Kahn
  - 1973 – Ethernet by Metcalfe @ PARC
  - 1974 TCP draft produced, split into TCP and IP in 1978
- **DNS – Distributed and scalable mechanism for resolving host names into IP addresses**
- **UC Berkeley implements TCP/IP into Unix BSD**
- **1985 – Internet used by researchers and developers**

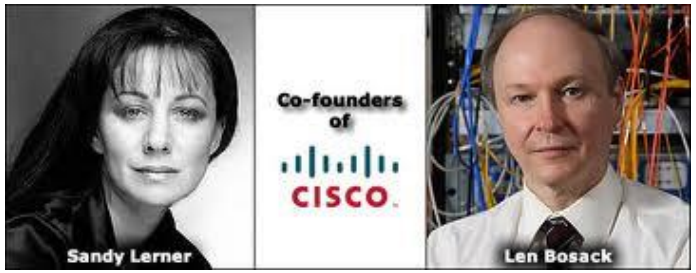



# History of Internet

- **November 1988 – Internet worm affecting about 10% of the 60000 computers on the Internet (Robert Morris, Cornell)**
- **Tim Berners-Lee at CERN in 1989**
  - Proposal for WWW in 1990
  - First web page on November 13, 1990

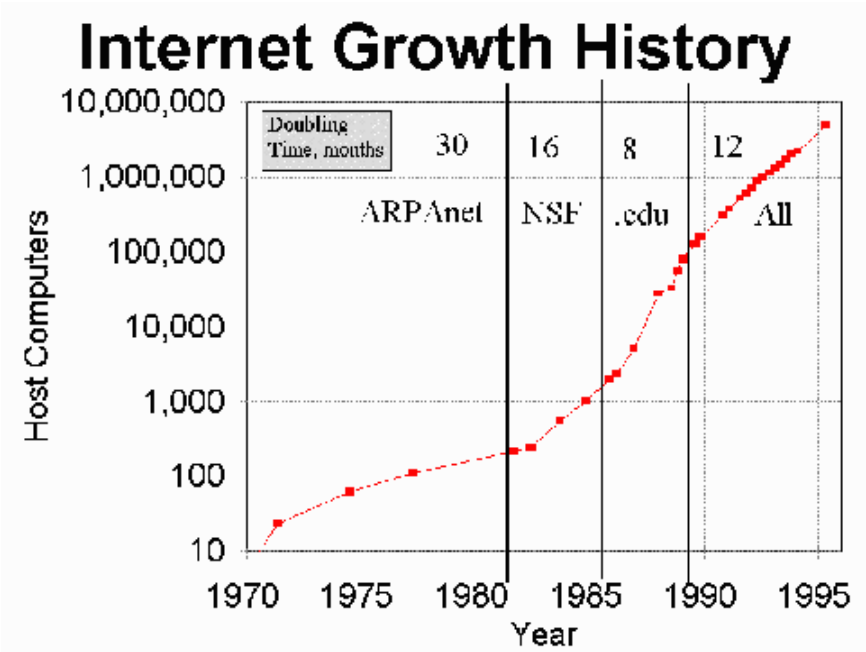


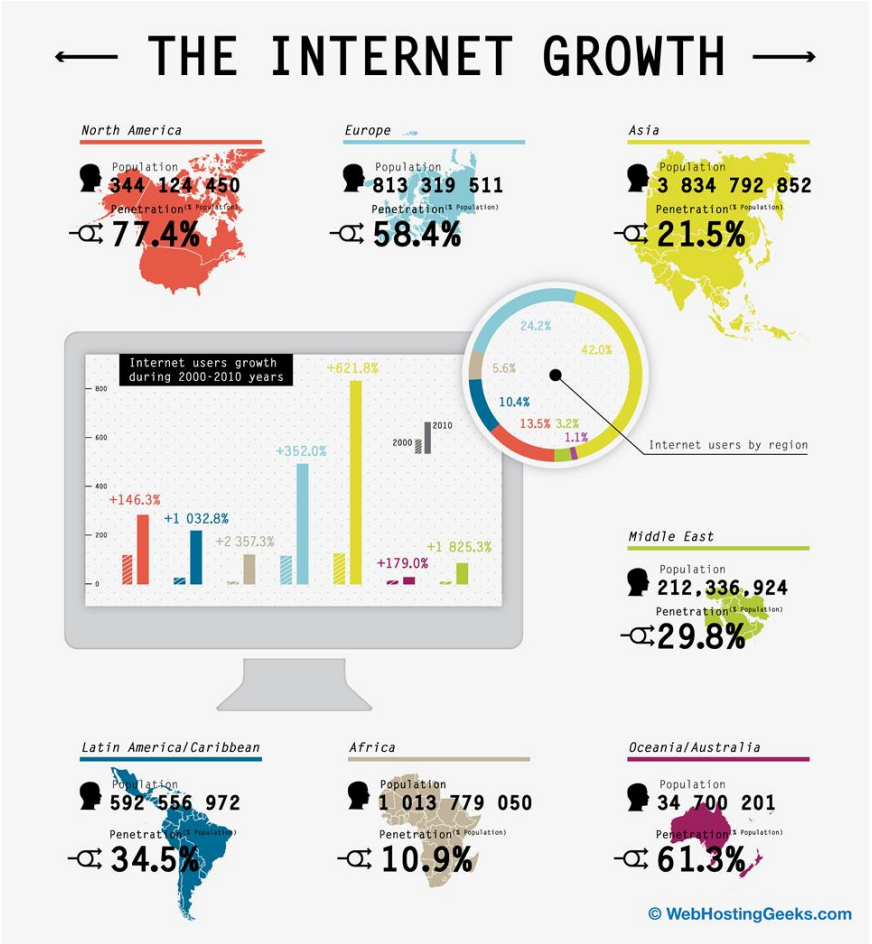

- **Cisco(1984), Google (1998), Facebook(2004), Twitter(2006), Dropbox(2008) …**



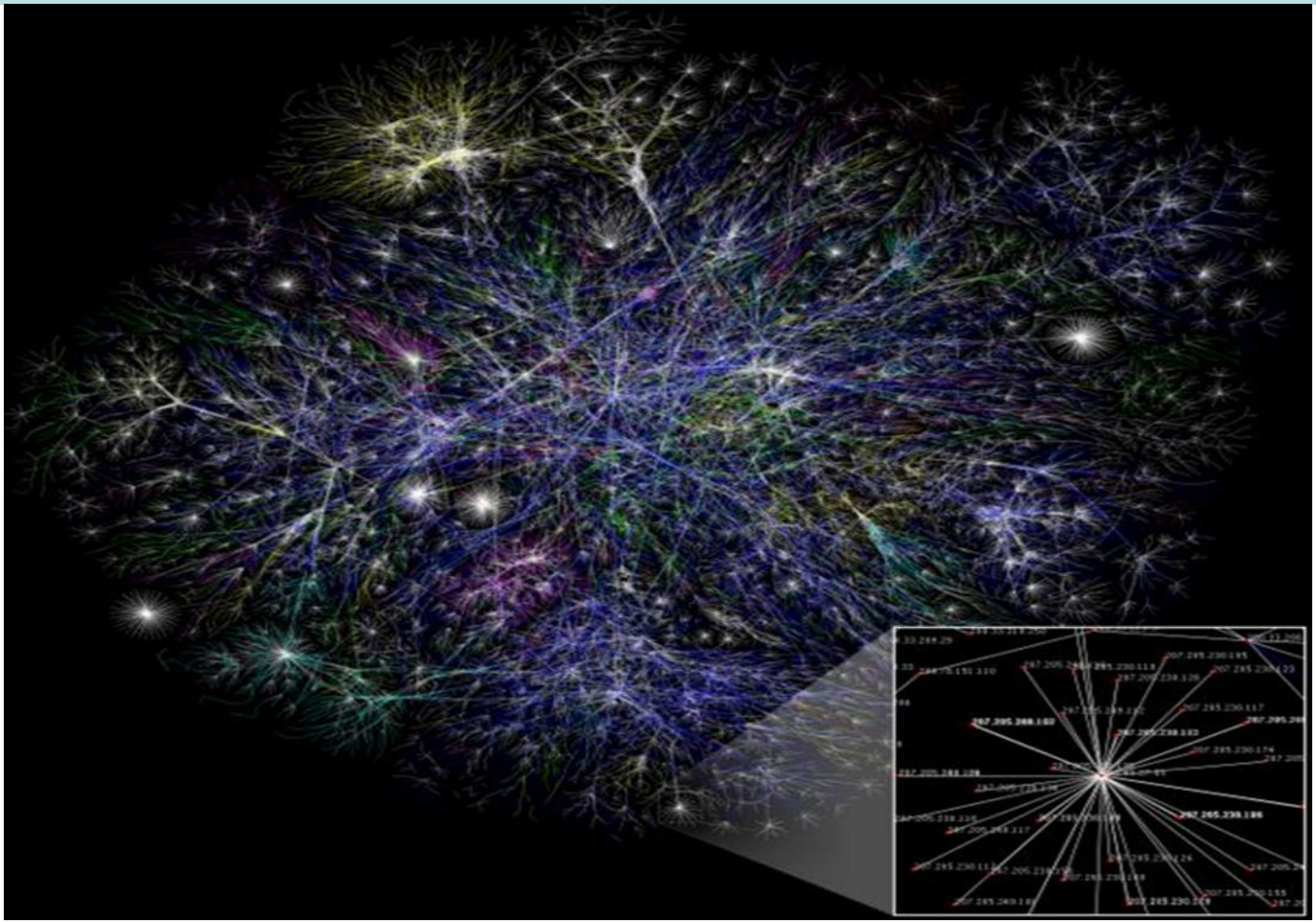


# Internet Growth Trends



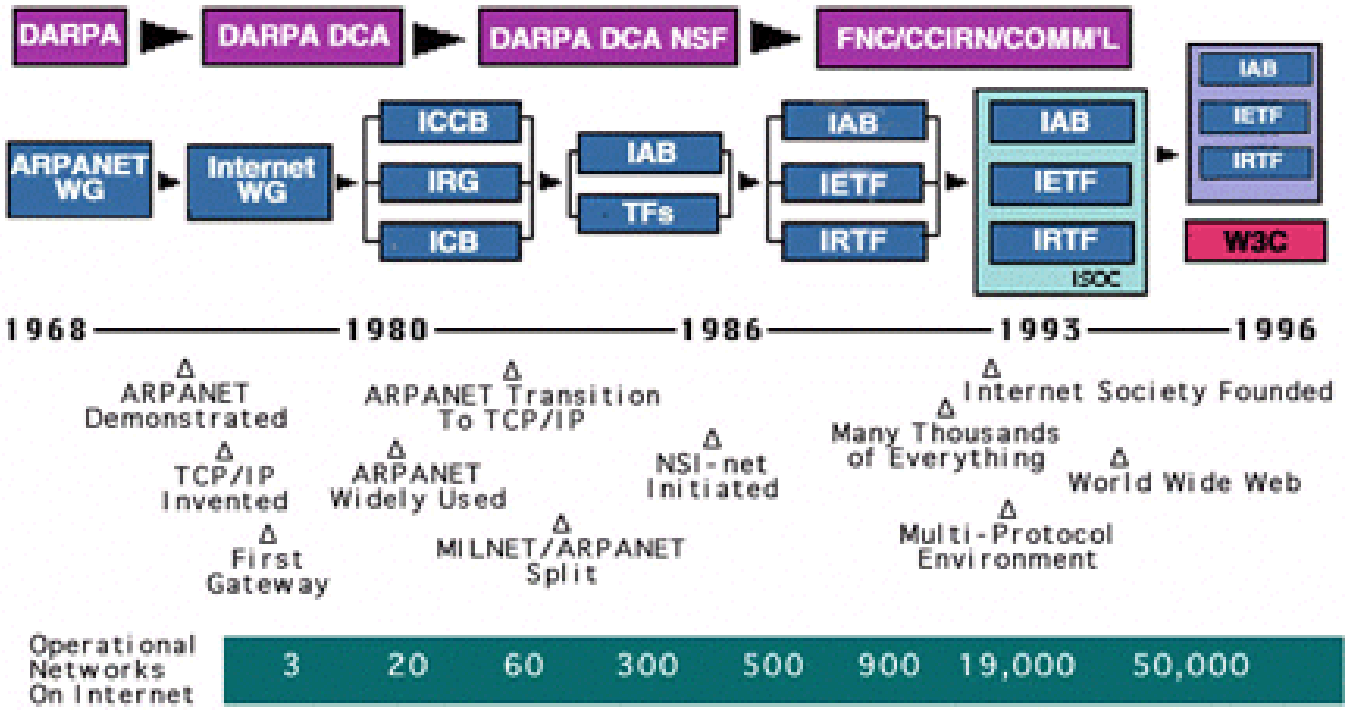
# Internet Map





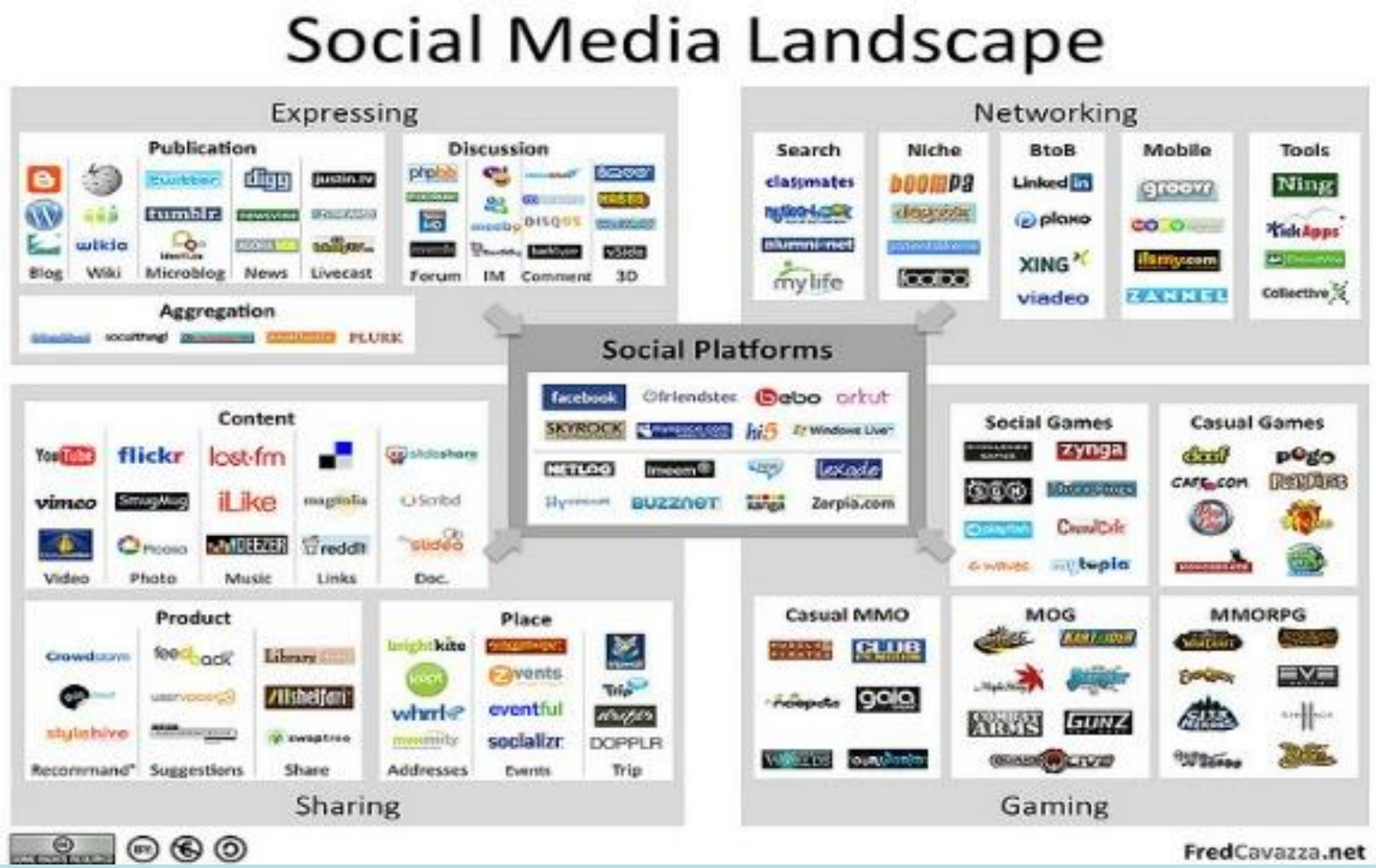
http://en.wikipedia.org/wiki/Image:Internet_map_1024.jpg

# Brief History of the Internet

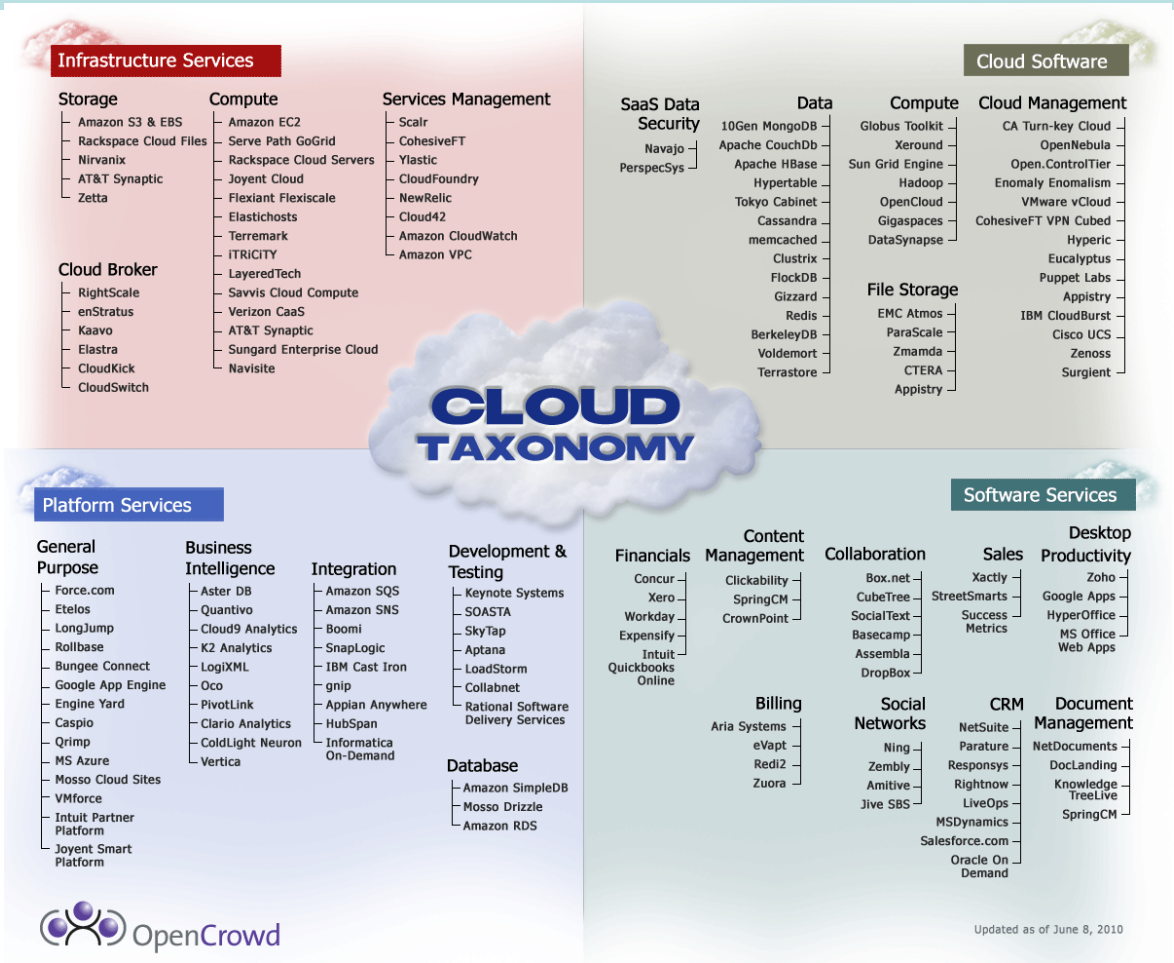



http://www.internetsociety.org/sites/default/files/Brief_History_of_the_Internet.pdf

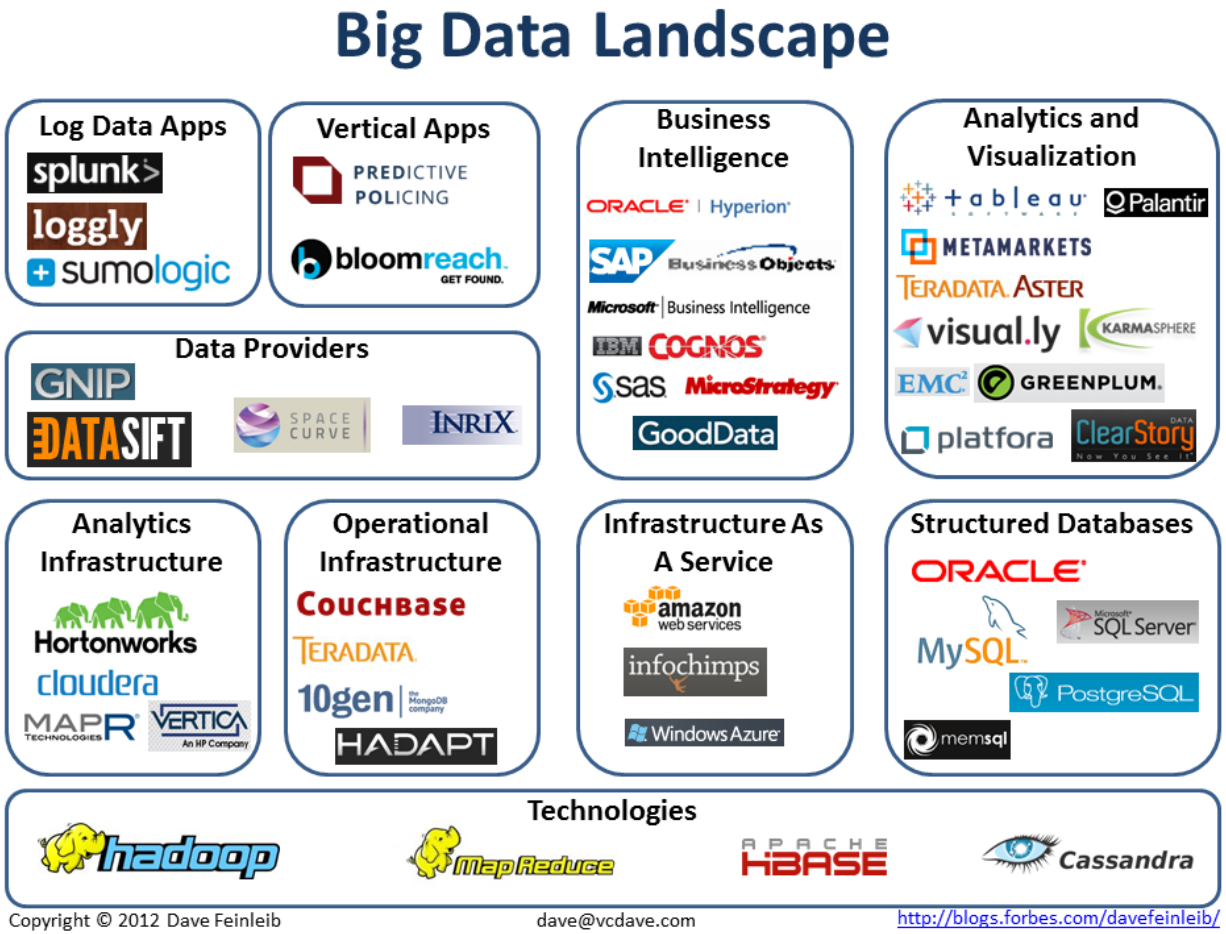
# Internet Trends: Social Media



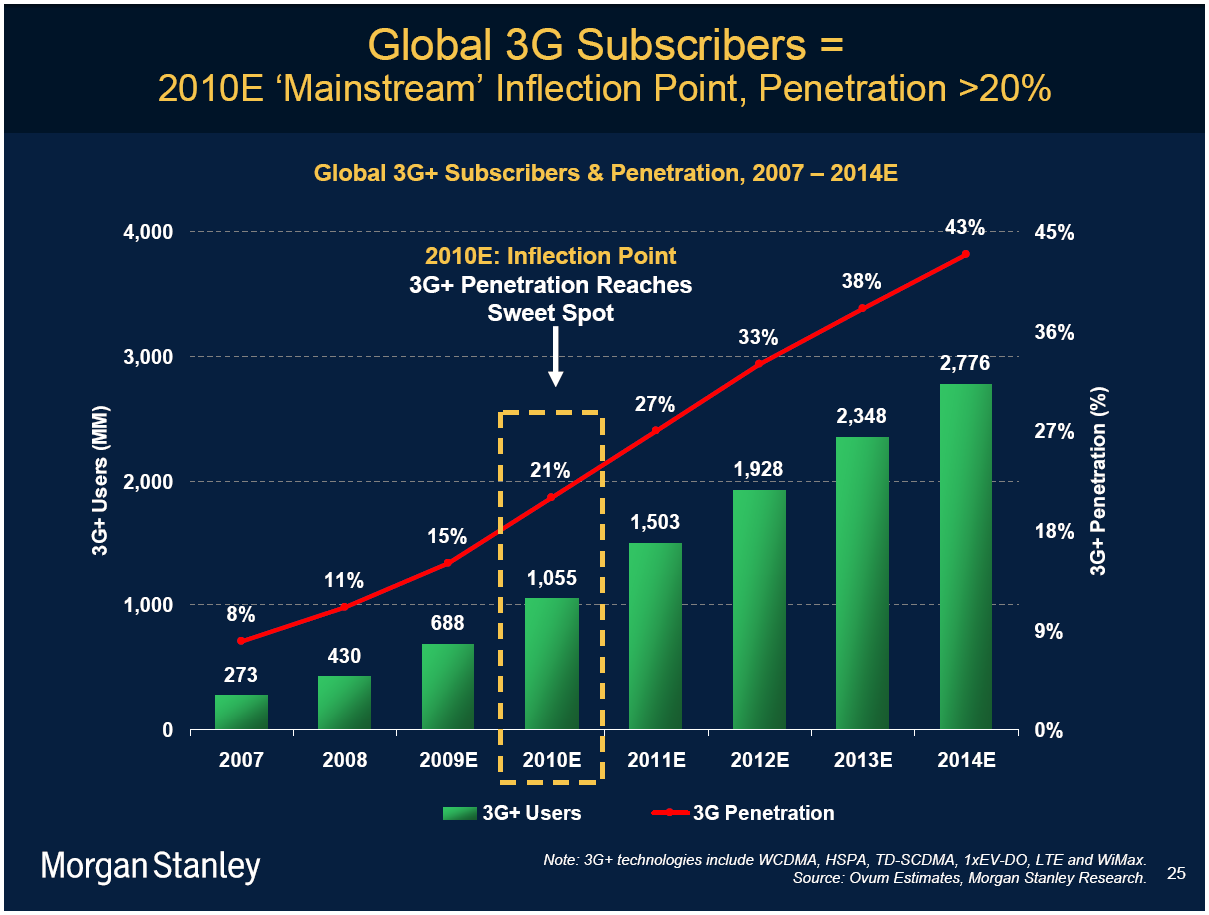
# Internet Trends: Cloud Computing



# Internet Trends: Big Data



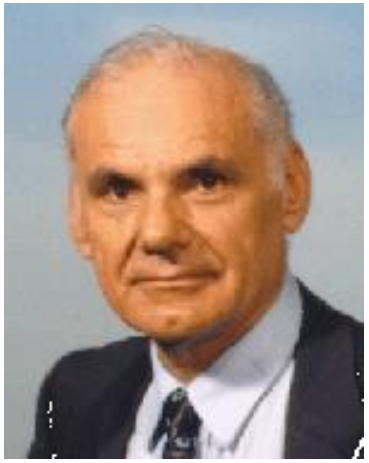
# Internet Trends: Mobile Internet

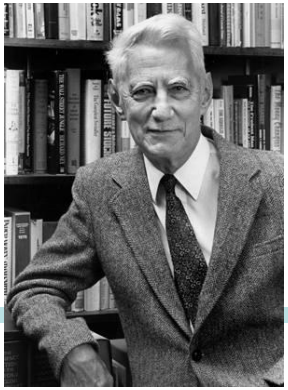


# Hot Spot: Silicon Valley

# Lessons Learned

- The Internet (and World Wide Web) we have today was created by some very bright, talented people who either had vision, or were inspired by other talented people's visions.
- Though their ideas were not always popular, they pressed ahead.
- Their perseverance and hard work brought us to where we are today.
- There is a lot to be learned by studying these people, their early work and keeping in mind what they had to work with.
- We, engineers, should aim to solve practical problems. Luckily, we might become rich.





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