

Computer Science 1401: Lecture #7

Computing and Privacy

COMPUTING AND PRIVACY: THE IMAGE

COMPUTING AND PRIVACY: THE REALITY

COMPUTING AND PRIVACY AT THE MOVIES:
The Net (1995)

Computing and Privacy: The Image



Sneakers (1992)

Computing and Privacy: The Image (Cont'd)



Enemy of the State (1998)

Computing and Privacy: The Image (Cont'd)



The Last Enemy (TV) (2008)

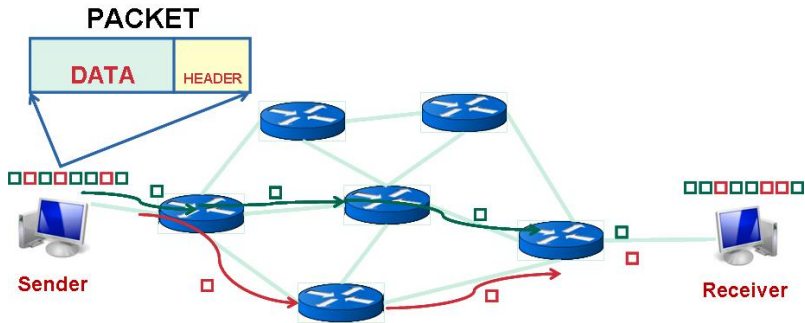
Computing and Privacy: The Reality

The Internet

- Began as ARPANet, a DoD Advanced Research Projects Agency (ARPA) 4-node pilot network built in 1969.
- Based on adaptive multi-route packet switching, cf., static single-route dedicated communication line.
- Characteristics:
 1. Distributed vs. centralized control.
 2. Packet can go anywhere regardless of origin or destination.
 3. Message costs distributed over all network nodes.
- Designed to share data and computing resources among a small group of trusted users.
- Security problems in core design noted in 1967.

Computing and Privacy: The Reality (Cont'd)

The Internet (Cont'd)



Computing and Privacy: The Reality (Cont'd)

The Internet (Cont'd)

- Wireless networking, E-mail, and easy communication between networks in place by 1974; government and academic networks explode by late 1970s.
- Commercial networks consisting of central servers connected via telephone modems to subscriber PCs emerge in late 1970s; evolve into national commercial networks in early 1980s, e.g., America On-Line (AOL).
- Effective commercial national network usage enabled by 1991 government-funded high-performance network upgrades (“information superhighway”) and 1992 amended commercial-usage rules for government-created networks.

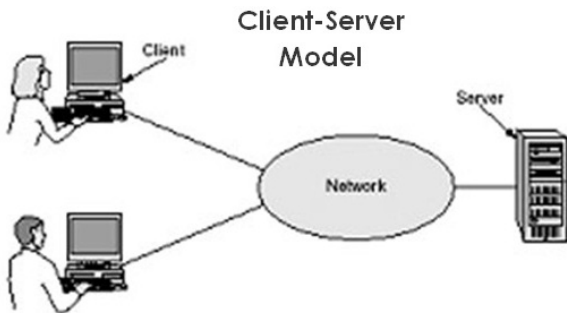
Computing and Privacy: The Reality (Cont'd)

The World Wide Web

- Basic World Wide Web (WWW) software available for free from CERN in 1991; originally designed for sharing large-scale multimedia particle physics datasets.
- Commercial-grade web browsers available in 1993; enables boom in search and retail web services, e.g., Yahoo! (1993), Amazon (1995), Google (1998).
- Overconfidence in Web 1.0 technical and financial potential leads to Dot-Com Crash in 2000.
- Ability of users to publish content (Web 2.0) leads to second Web boom and social media services, e.g., Wikipedia (2001), Facebook (2005), Twitter (2006).

Computing and Privacy: The Reality (Cont'd)

The World Wide Web (Cont'd)



- Five components of WWW system: (1) content location specifier (URL), (2) web page creation language (HTML), (3) web page transmission protocol (HTTP), (4) web page distribution (server software), and (5) web page display (client-based web browser software).

Computing and Privacy: The Reality (Cont'd)

Dealing with Privacy

- Asymmetric (two-key) cryptography proposed to mitigate Internet privacy problems in 1975; allows both secure message transmission and secure digital signatures.
- Fought against by US government security agencies via (1) legal weaponization of cryptography and (2) legal imposition of agency-crackable cryptographic standards, e.g., DES, Clipper; ended in 1999 under industry pressure.
- Following 9/11 attacks, terrorism has been invoked to (1) pressure companies to decrypt data on request and (2) increase the extent and abilities of covert electronic surveillance, e.g., PRISM (NSA), TEMPORA (GCHQ).
- Flaws in commercial software exploited by cyber-criminals cause other problems, e.g., 2017 EquiFax data breach.

Computing and Privacy At The Movies: *The Net* (1995)



- Inspired by privacy concerns over the explosion in public use of both the Internet and the World Wide Web in the early 1990s.
- Focus on identity theft and stored data manipulation.
- By making the victim a savvy IT professional, heightened general public worries about data privacy and security.