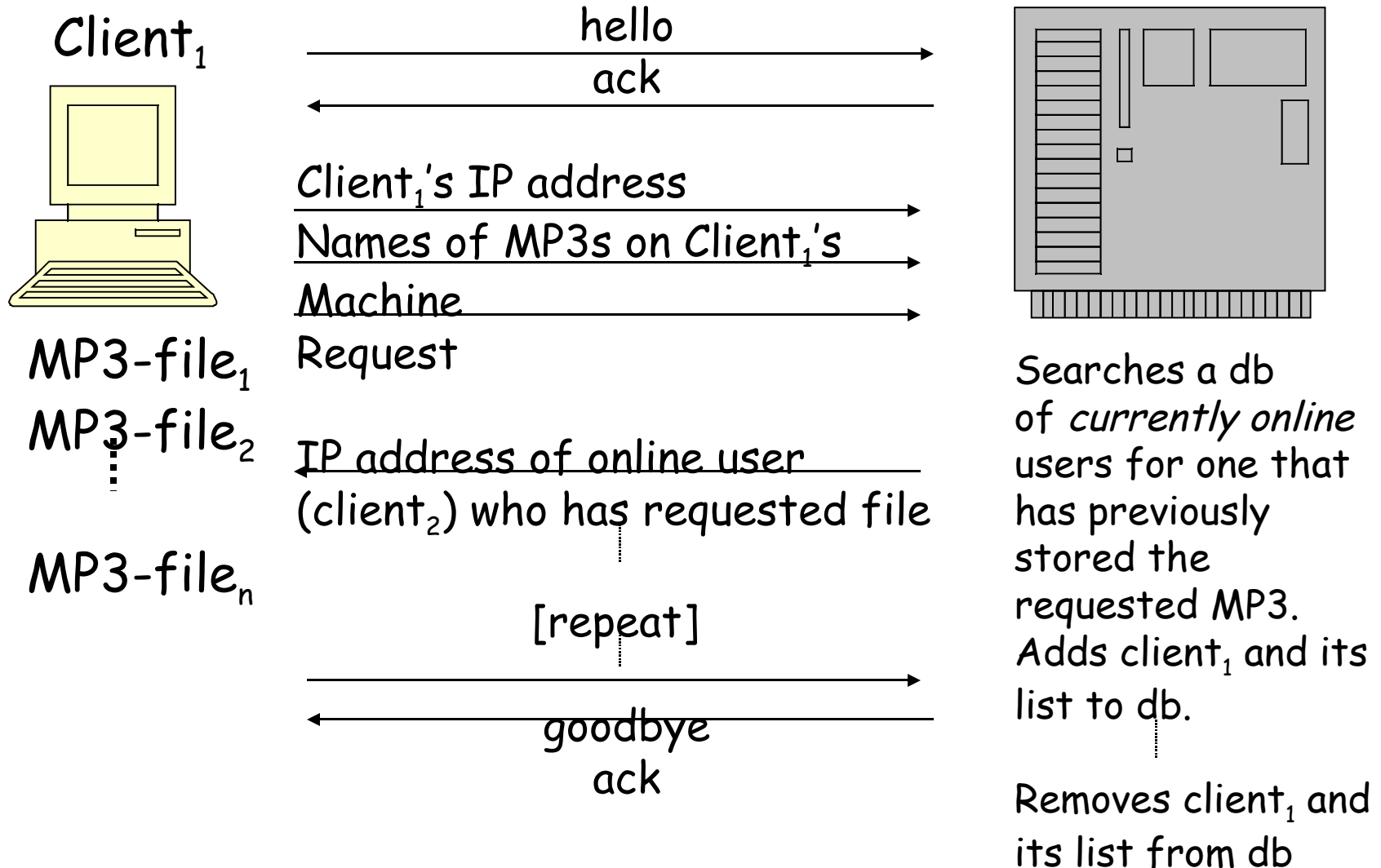


# **CPSC 156: The Internet: Co- Evolution of Technology and Society**

**Lecture 9: February 13, 2007**

**Online Music Distribution  
and the DMCA**

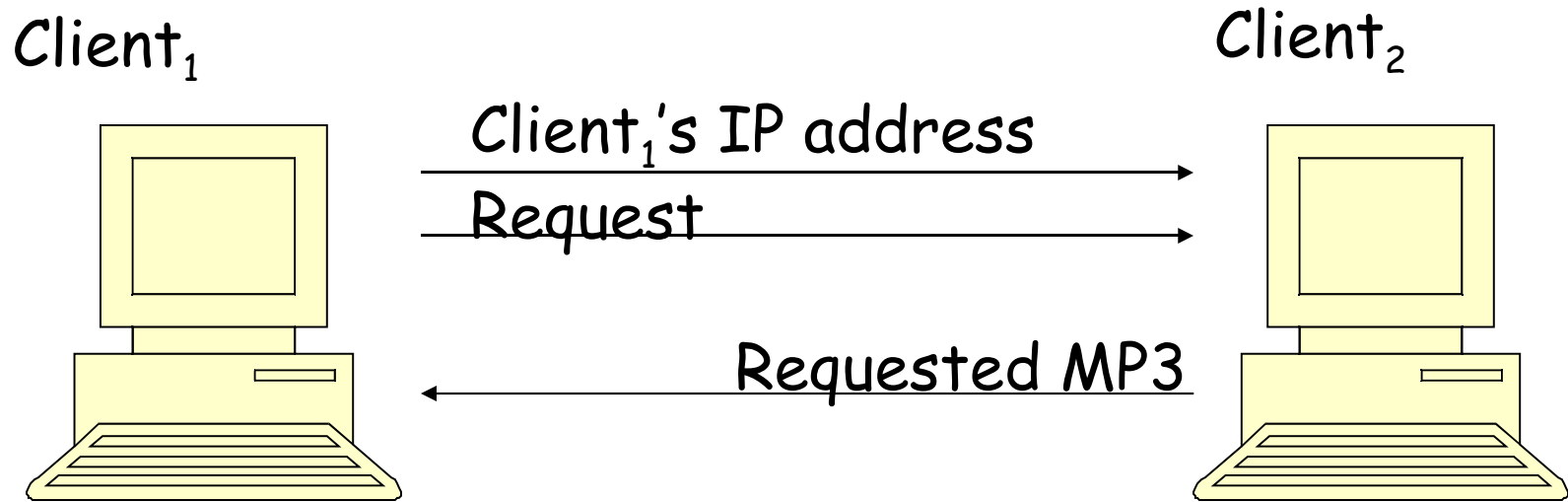
# Napster Client-Server Interaction



# Notes on Client-Server Interaction

- Proprietary protocol and db search.
- No MP3 files stored on server.
- Don't *need* usernames. Could have made the service anonymous.
- No need to save IP addresses between sessions. Many are assigned dynamically.
- Discussion point: Are anonymity and memorylessness threats or opportunities for business?

# Napster Client-Client (P2P) Interaction



Note: This part uses "standard Internet protocols," e.g., FTP

# Napster History

- 1987: MP3 format developed by Karlheinz Brandenburg of Fraunhofer Gesellschaft. "CD ripping" now feasible.
- 1999: Shawn Fanning develops Napster, believing he has "bypassed" copyright law. Napster has >25M users in its first year.
- Dec., 1999: RIAA sues Napster for "contributory and vicarious" copyright infringement.
- April, 2000: Metallica sues Napster, Yale, Indiana Univ., and USC. (Yale bans the use of Napster within a week.)

# Napster History, continued

- July, 2000: US District Judge Patel grants RIAA's request for an injunction. The injunction is temporarily stayed soon thereafter.
- October, 2000: Napster announces a partnership with Bertlesmann AG (one of the "major labels" in the industry whose trade association is suing it!).
- January, 2001: Napster and Bertlesmann say that they will roll out a "subscription service" by "early summer" and will use "DRM technology."

# Napster History, continued

- February, 2001: Ninth Circuit upholds lower court's findings that Napster is guilty of contributory and vicarious infringement.
- Summer, 2001: Napster and Bertlesmann fail to roll out subscription service.
- September, 2001: Napster reaches a settlement with music publishers (but not with RIAA record labels). However, CNET.com reports the number of users has "dropped from tens of millions...to almost zero."

Napster, R.I.P.

# RealNetworks Business Model

- The basic RealPlayer software is free. Users may pay a small fee for an advanced version with more features. This is one of the RealNetworks revenue streams.
- Services and advertising constitute a separate revenue stream.
- A third revenue stream is derived from charging broadcasters of streaming data for the RealServer software.
- In summary, the (slightly oversimplified) business model is: Give away the player, sell the server!



# "Daft Club" Model

Purchase Daft Punk CD and you also get a "personalized code" that gives you access to the Daft Club server. From it you get:

- Ability to download a new Daft Punk "bonus track" each month. The bonus tracks are not released on CDs.
- Access to the rest of the Daft-Club user community.

Bonus tracks will be wrapped with DRM metadata that says they can't be copied. Almost surely circumventable, but would many people bother circumventing?

# “Napster++ as Superdistribution” Model (Napster--??)

- Napster users pay monthly subscription fee.
- They can download DRM-wrapped songs from Bertlesmann server. (And other labels if others also settle.)
- When they redistribute via P2P file sharing, they get rebates on their next month's subscription fees. DRM system keeps track.
- They retain the chat-room, “Napster community” network effects.

Again, probably circumventable. But is there a price point at which circumvention would not be worth it?

# "Street Performer" Model

Novelist gives chapter 1 to publisher and promises rest of book after she is paid  $\$X$ .

Publisher posts chapter 1, collects payments, issues signed receipts to customers ("donors"?).

If publisher collects  $\$X+Y$ , he gets rest of book from novelist, posts it, gives  $\$X$  to novelist, and keeps  $\$Y$ .

If he collects less than  $\$X+Y$ , he sends refunds to customers. Also, if novelist doesn't deliver rest of book, she gets bad publicity and customers get refunds.

# "Street Performer" Model (Cont.)

Many variations:

- New author gives first book away.
- Non-anonymous big donors
- Some publishers "edit" and choose, and some don't.
- Famous authors don't have to deliver chapter 1 in advance.

# "Hum A Few Bars" Model (K. McCurley, Financial Crypto '00)

"I listen to music in the living room, in the office, in the car, in the shower, and while jogging. I want the music companies, consumer-electronic companies, and data-networking companies to wire these environments so that I can hum a few bars and get the song I've hummed looked up, retrieved from their databases, and piped into my speakers. I'd expect to pay one monthly fee, as I do for cable TV."

JF Note: Can be "all streaming"; no need to clutter your living room floor or your computer disk with a "CD collection." Music will be purely a service, not a product.

# Notable Business-Model Components

- + Buy one song at a time (cheap!).
- ? "Lock" content to user.
- "Lock" content to device(s).
- "Play k times."

# Discussion Point

After many years of online music distribution, many failed business models, and the success of iTunes, we have Jobs's suggestion to do away with DRM.

Key component of the argument: People who are currently paying for music *are not doing it because DRM has forced them to.*

# Digital Video Disks (DVDs)

- Developed by movie studios and consumer electronics companies in 1995.
- Compatible with CDs. Same size and thickness as CDs. Up to 25 times the storage capacity as CDs.
- TPS for DVDs includes
  - CSS encryption ("content scrambling system")
  - R/W'able copy-control marks (e.g., "copy freely," "one copy," "no copies")
  - Macrovision analog copy protection
  - Other ingredients



# Studios' Overall IP-Management Strategy

- Use TPS to “keep honest people honest.”
- Assume (temporarily) that lack of bandwidth will prevent large-scale Internet distribution of movies.
- Use courts aggressively to punish (alleged) violators of existing copyright laws and *lobby heavily* for new laws that favor rights holders.

# Digital Millennium Copyright Act (1998)

- Illegal, except under narrowly defined special circumstances, **to circumvent effective technological protection measures**
- Illegal to distribute **circumvention tools**
- Gives content owners a property right in TPS as well as the content that the TPS protects. In SAT terms, circumvention is to infringement as breaking and entering is to burglary.

# Examples of Allowed Circumventions

- Nonprofits may circumvent to “shop.”
- Law enforcement and intelligence agencies.
- Reverse engineering to achieve interoperability.
- “Encryption research.” The “researcher” has to “make a good faith effort to obtain authorization.”
- Protection of “personally identifying information.”

# Techies' Objection to DMCA

- What is an “**effective** technological protection measure?”
  - If a skilled hacker can break it, is it “**effective**”?
  - If an average computer-literate person can break it, *but few do*, is it “**effective**”?
- Weakens incentives for content owners to pay for good IP-management technology.
- Shifts costs from content owners to society at large, by shifting responsibility from TPSs to courts and police.
- **Exceptions for R&D are vague.**

# DMCA vs. Copyright Violations

## Questions:

- What does the DMCA actually do to existing copyright law?
- What happens to fair use?
- Are there differences between **violations of copyright law** and **violations of the DMCA**?

# DeCSS Violates DMCA

- DeCSS is software that reads CSS-scrambled video from a DVD and writes unscrambled MPEG-2 video.
- In effect, DeCSS **circumvents** the TPS for DVDs.
  - Question: Is CSS an **effective** copy-protection mechanism?

# DeCSS Violates DMCA (continued)

- Magazine that published the DeCSS algorithm got sued.
  - **Question:** Is this different from "a reputable journal" publishing **research**?
- **Question:** Is DeCSS different from a regular DVD player?
- **Questions:** Does DeCSS fit under any of the DMCA exceptions? Where is the **copyright violation**?

# Adobe eBook Processor

## Violates DMCA

- Adobe established one format for electronic books: the **eBook**.
- To use eBooks, purchase and download them, and view them using a special reader (Adobe eBook software).
- The eBook format contains provisions for publisher controls on:
  - Text-to-speech processing
  - Copying to another device or making a backup
  - Translating between formats



# Adobe eBook Processor Violates DMCA (continued)

- ElcomSoft, a Russian company, created **AEBPR**, the **eBook Processor**.
  - AEBPR translates eBooks to Adobe PDF.
  - Software available for purchase on ElcomSoft's website and through a U.S. firm, RegNow (used for handling payments).
- Dimitri Sklyarov, one of the designers, presented his methods at DEF CON, a conference in the U.S.

# ElcomSoft's Product Webpage

<http://www.elcomsoft.com/prs.html>



## Password Recovery Software



INFORMATION  
SECURITY

Forgot your password? Need to access some password-protected files or systems? Former employees leave without un-protecting their files? Passwords destroyed? Are you worried that your encrypted files may not be secure? We can help! Using our software you can easily recover passwords for the files created in most popular applications including:

### New (integrated) packages

Compression utilities (archives): ZIP/PkZip/WinZip, RAR/WinRAR, ACE/WinACE/ARJ/WinArj (updated!)  
Microsoft software: Word, Excel, Access, Outlook, PowerPoint, Project, Visio, VBA, Money, Mail, Scheduler+, IE (updated!)  
E-mail clients (Netscape, Eudora, TheBat!, Pegasus etc)  
Instant Messengers (ICQ, Yahoo!, AOL IM, MSN Messenger, Excite Messenger, Odnigo, Trillian)

### Archives

ZIP, WinZIP, PkZip (updated!)  
RAR, WinRAR  
ACE, WinACE  
ARJ, WinArj

### Microsoft Office

Microsoft Access 95/97/2000  
Microsoft Word (all versions) (updated!)  
Microsoft Excel (all versions) (updated!)  
Microsoft Outlook (PST)  
Microsoft Outlook Express (updated!)  
VBA (Visual Basic for Applications)

### Other Microsoft software

Microsoft Project  
Microsoft Money  
Microsoft Backup  
Windows NT (user-level security) (updated!)

### Other software

Intuit Quicken  
Intuit QuickBooks (updated!)  
Lotus SmartSuite (Organizer, WordPro, 1-2-3 and Approach) (updated!)  
Adobe Acrobat (PDF) (updated!)  
Borland/Corel Paradox  
Corel WordPerfect (new!)  
Symantec ACT! (updated!)

Dictionaries and wordlists (updated!)  
Dictionary and password generators (updated!)

Subscribe to Password Recovery Software mailing list.

# Adobe eBook Processor Violates DMCA (continued)

- Sklyarov was arrested for **violating the DMCA** by circumventing Adobe's protection built into the eBook format.
- **Question:** Does it matter that Sklyarov was working for a company?
- **Question:** Does it matter that the company is Russian, and that its software is legal in Russia?

# Adobe eBook Processor Violates DMCA (continued)

- **Question:** Does the software simply allow “fair use” that was prevented by Adobe’s format? (Does that even matter?)
  - People can make backups of eBooks they bought and don’t want to lose.
  - People can transfer copies to their laptop or handheld.
  - People with visual impairments can have the computer read the eBook.
- **Other Questions:** Is AEBPR a product of research? Is the eBook an **effective** TPS?