
Chapter 15: Making Decisions about Computers, Information, and Society

Invitation to Computer Science,
C++ Version, Third Edition

Objectives

In this chapter, you will learn about:

- Case studies
- What we covered and what we did not

Introduction

- There are many personal and societal issues related to computing and information
- Decisions regarding these issues should be well-informed and well-reasoned

Case Studies

- Case 1: The story of MP3 – compression codes, musicians, and money
- Case 2: PGP: The U.S. Government vs. Phil Zimmermann
- Case 3: Hackers: Public enemies or gadflies?
- Case 4: Genetic information and medical research

Case 1: The Story of MP3 – Compression Codes, Musicians, and Money

- MP3 protocol
 - Compresses digital files that store audio information
- Napster
 - Enabled peer-to-peer file sharing
 - Allowed users to share music files with other users and obtain music files from other users

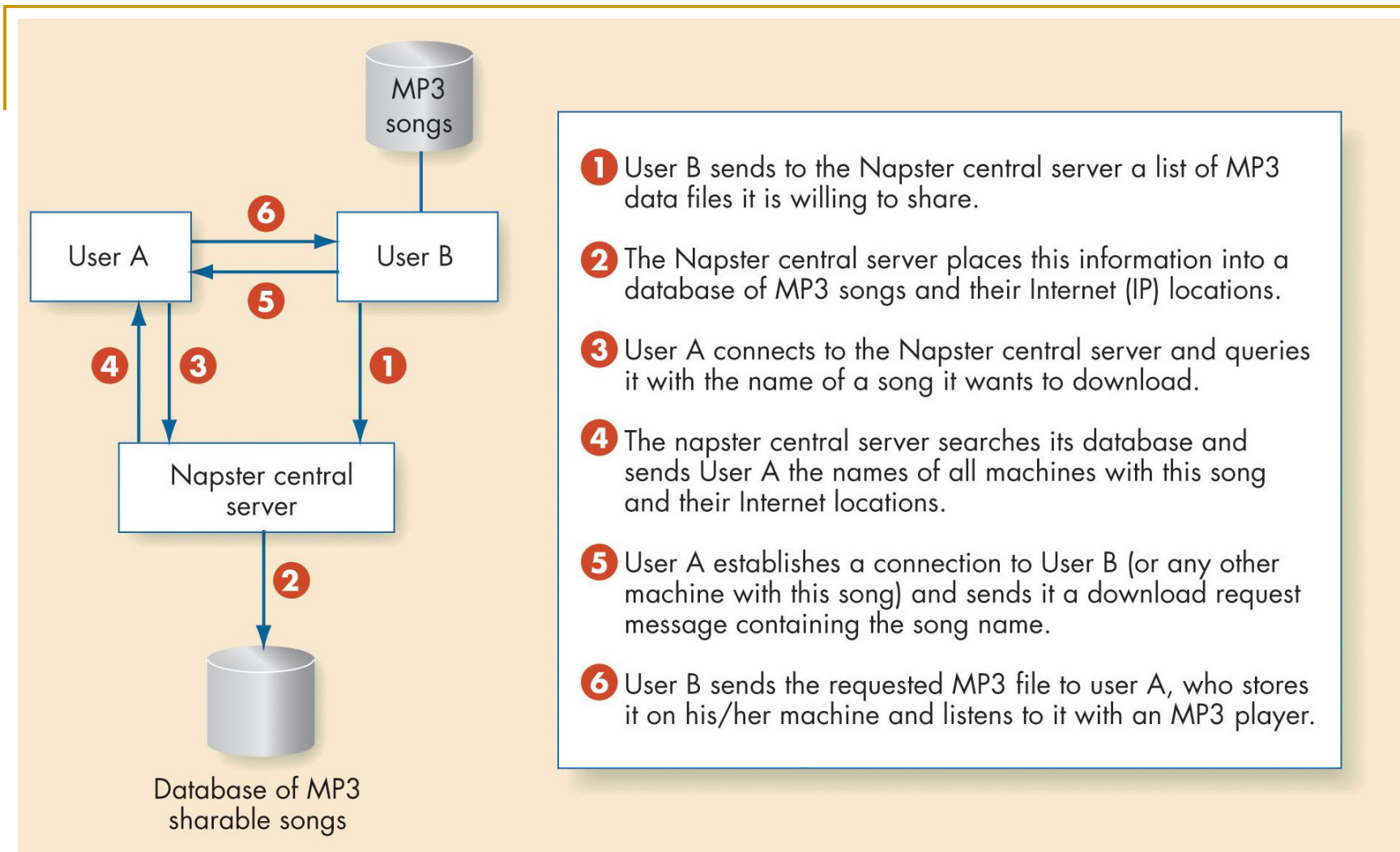


Figure 15.1
Peer-to-Peer File Sharing Created by Napster

Case 1: The Story of MP3 – Compression Codes, Musicians, and Money (continued)

- Recording companies filled a suit against Napster on grounds of copyright infringement
- Napster lost the case and subsequent appeals

Case 1: The Story of MP3 – Compression Codes, Musicians, and Money (continued)

- Ethical question

- Is it ethically right to swap copyrighted MP3 files?

- Ethics

- The study of how to decide if something is morally right or wrong

Case 1: The Story of MP3 – Compression Codes, Musicians, and Money (continued)

- A consequentialist focuses on the consequences of an act to determine if the act is good or bad
- Utilitarians
 - The most well-known consequentialists
 - Focus on the consequences of an act on everyone to determine if it is good or bad

Case 1: The Story of MP3 – Compression Codes, Musicians, and Money (continued)

- Utilitarian argument #1: MP3 copying is OK
- Utilitarian argument #2: MP3 copying is not OK

Case 1: The Story of MP3 – Compression Codes, Musicians, and Money (continued)

- A dialectic
 - Move back and forth between different viewpoints, criticizing each and trying to learn from each
 - Goal: both sides move closer to the truth from two different perspectives

Case 2: PGP: The U.S. Government vs. Phil Zimmermann

- Phillip Zimmermann
 - ❑ Concerned about bills introduced in the U.S. Congress to allow the government to restrict the use of encryption
 - ❑ Developed the PGP (Pretty Good Privacy) encryption algorithm
 - ❑ Made PGP freely available to anyone

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- U.S. Government started a criminal investigation against Zimmermann
 - Claim: Zimmermann had released a technology that would allow criminals and terrorists to avoid detection by law enforcement agencies

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- Ethical question
 - Was it right for Zimmerman to distribute his encryption program, or was the government right to try to prohibit its distribution?
- Analogies can be used to explore ethical questions
- In any analogy between two things, there are both similarities and differences

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- A dialectic argument that uses analogies
 - One analogy supports a particular view of the situation
 - Another analogy supports an opposing view of the situation
 - The participants in the discussion explore the strengths and weaknesses of each argument

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- Simplification for exploring the PGP controversy using analogies
 - The discussion is limited to the use of the PGP algorithm for email security
- Analogy #1: Email is like a private conversation
- Analogy #2: Email is like phone conversations

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- In both analogies, there are similarities and differences between the two things being compared
- Only the similarities and differences that are ethically relevant should be considered

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- Analogies give a better understanding of the ethical issues behind the PGP debate
 - A decision about PGP affects security and privacy
 - Catching criminals and stopping terrorists are two good things
 - Having personal privacy is a good thing

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- The utilitarian perspective:
 - What would be the consequences of enforcing a ban on PGP?
 - What would be the consequences of allowing people to use PGP?

Case 2: PGP: The U.S. Government vs. Phil Zimmermann (continued)

- Using analogies and a utilitarian analysis:
 - The increased security of a PGP ban would be bought at a very high price

Case 3: Hackers: Public Enemies or Gadflies?

- Definition of “hacking” for this discussion
 - Gaining unauthorized access to someone else’s computer system
- Ethical question
 - Is there an ethical case to be made in support of computer hackers?

Case 3: Hackers: Public Enemies or Gadflies? (continued)

- Analogy
 - Breaking into a computer is like breaking into someone's house
- The similarities and differences between burglars and hackers should be analyzed
- Utilitarian analysis
 - What is gained/lost when a computer is hacked

Case 3: Hackers: Public Enemies or Gadflies? (continued)

- Two challenges when using a utilitarian argument
 - It is sometimes hard to predict consequences with any accuracy
 - There seems to be a distinction between “good hackers” and “bad hackers”

Case 3: Hackers: Public Enemies or Gadflies? (continued)

- A deontological argument can be used to try to meet these challenges
- Deontological arguments focus on
 - Intent of an act
 - How that act is/is not defensible

Case 3: Hackers: Public Enemies or Gadflies? (continued)

- Deontological perspective on hacking
 - Is the act of hacking into another person's computer system inherently unethical?
- At the end of the analysis, questions are raised about the claims of the hacker ethic

Thinking Straight about Technology and Ethics

- A “paramedic method” for computer ethics
 - Goal is not to become a research ethicist, but to gain skills in:
 - Recognizing ethical questions regarding computing
 - Reasoning carefully about answers to those questions

Thinking Straight about Technology and Ethics (continued)

- Questions to ask in dealing with an ethical problem
 - Who are the stakeholders in this situation?
 - What does each stakeholder have to gain or lose?
 - What duties and responsibilities in this situation are important to the stakeholders?

Thinking Straight about Technology and Ethics (continued)

- Questions to ask in dealing with an ethical problem (continued)
 - Can you think of an analogous situation that does not involve computing? If so, does that analogous situation clarify the situation that does involve computing?
 - Either make a decision or revisit the steps

Case 4: Genetic Information and Medical Research

- Fictional case
 - ❑ You are at your doctor for a routine checkup
 - ❑ The doctor asks you to participate in a study of genetic diversity and disease by donating some skin cells for the study
 - ❑ The doctor informs you that your skin cells will be identified only by a randomly assigned number and your zip code
 - ❑ Should you donate your cells?

Case 4: Genetic Information and Medical Research (continued)

- The paramedic method:
 - Step 1: Identify stakeholders
 - Step 2: What is at stake?
 - Step 3: Identify duties and responsibilities
 - Step 4: Think of analogies
 - Step 5: Make a decision or loop through the method again

What We Covered and What We Did Not

- Introduced a few of the issues involving technology and society
- Discussed how to apply the following to computer ethics
 - Utilitarian ideas
 - Deontological ideas
 - Analogies

What We Covered and What We Did Not (continued)

- Topics not mentioned
 - Rawlsian negotiation
 - Virtue ethics
 - Other ethical techniques

Summary of Level 6

- Level 6: Social Issues
 - Looked at several case studies involving computer technology
 - Showed how even straightforward situations have many different ethical implications
 - Provided some tools for coping with ethical decision-making

Summary

- Ethics: how to decide if something is morally right or wrong
- Utilitarian: focus on the consequences of an act on everyone to determine good/bad
- Dialectic: move back and forth between different viewpoints, criticizing each and trying to learn from each

Summary

- Analogies can help explore ethical questions
- Deontological arguments focus on the intent of an act and how that act either is or is not a defensible, responsible act