Copy rights & DRM

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Copy Right and DRM

Copy rights

Is a legal concept, enacted by most governments, giving the creator of an original work exclusive rights to it.

DRM

DRM is a class of access control technologies with the intent to limit the use of digital content and devices after sale.

Digital rights management

Basic Mechanism

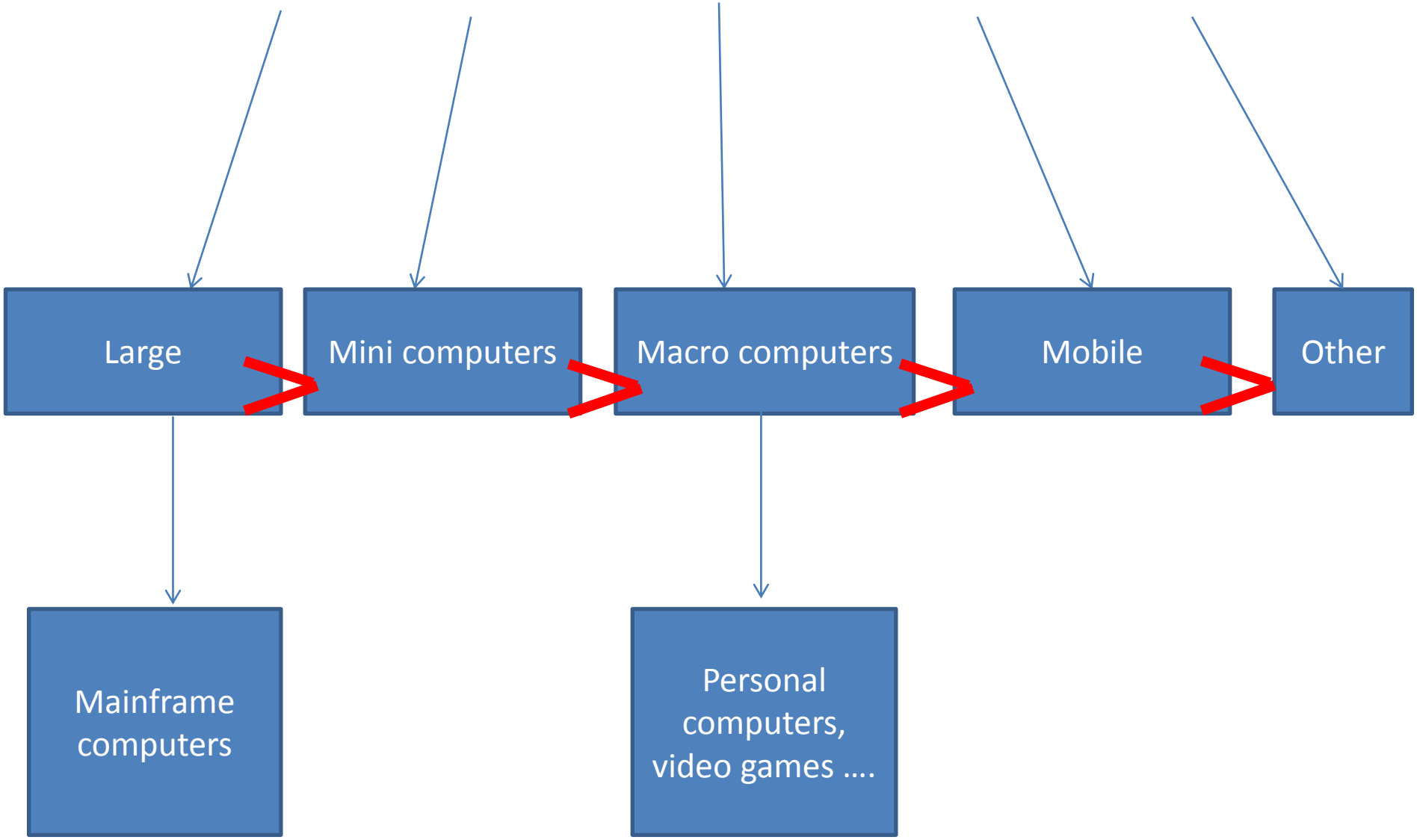
The basic mechanism is making encrypted files of the program available, and then to sell separately a license which is a key number for opening the encrypted file.

DRM& Software

For early computers, protecting software was not an issue Because:

1. Software was given away free by the hardware vendors or by users who written it
2. Almost all organizations that owned computers were large and respectable.
3. The software tended to require skilled maintenance.

Classes of computers



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The beginning of Software protection:

- When minicomputers arrived in the 1960, software costs started to become significant. Hardware vendors started to charge extra for their operating system.

- By the mid-1970, some of them had turned bespoke systems into packages.

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The most common copyright dispute back then was:

When a programmer left your company to join a competitor, and their code suddenly acquired a number of your features.

The standard way to resolve such a problem is :

By looking at *software birth-marks*

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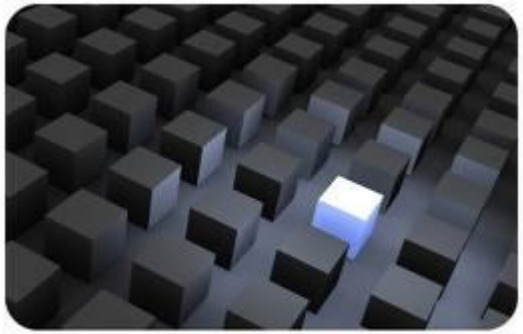
When software piracy really started to become an issue:

- The arrival of microcomputers in the late 1970 and early 80 created a mass market, and software houses started to ship products that didn't need support to install and run.
- Microcomputers had no processor serial numbers.

There was general approache tried:

To find out uniqueness in these computers



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Most common mechanisms:

1. The standard way to add hardware uniqueness was a *dongle*

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Most common mechanisms:

2. A cheaper and very common strategy was for the software to install itself on the PC hard disk in a way that was resistant to naive copying.

3. A product checks the PC configuration - what cards were present, how much memory, what type of printer - and if this changed too radically, it would ask the user to phone the helpline.

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Generic attack that works against most of these defenses:

Is to go through the software with a debugger and remove all the calls made to the copy protection routines.

- Many hobbyist did this for sport, and competed to put unprotected versions of software products online
- Even people with licensed copies of the software often got hold of unprotected versions as they were easier to back up and often more reliable generally

You can stop this by having critical code somewhere really uncopiable, such as dongle(which costs a lot) – *but the lesson is that kids with the debuggers would always break your scheme eventually*.

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The vendors also used psychological techniques such as:

1. The installation routine for many business programs would embed the registered user name and company on the screen

2. Industry publicists retailed stories of organizations that had come unstuck when they failed to get a critical upgrade of software they hadnt paid for.

3. If early Microsoft software (Multiplan, Word or Chart) thought you were running it under a debugger, trying to trace through it, it would put up the message “The tree of evil bears bitter fruit. Now trashing program disk.”

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Then Business software vendors stopped trying to protect mass market products using technical means because of many reasons such as:

- Technical support became more and more important
- Unless you're prepared to spend money on seriously tamper resistant dongle hardware, the mechanisms will be defeated by people.
- Operating system interfaces became higher level, and software protection routines of the 'bad disk sector' variety became harder to write.
- People who got a pirate copy of the product and liked it would often buy a regular copy.
- Protection is a nuisance.
- Many vendors preffered not to have worry about whether the software was licensed to the user or to the machine.

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Software piracy& the Law:

Then the industry swung to legal solutions

- The main initiative was to establish anti-piracy trade organizations in most countries

- The industry discovered that the law not only provides tools for enforcement, but sets limits too.

- ***License servers***.

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Summary

- The model to which the software industry is converging is thus one that combines technical and legal measures
- None of the mass-market protection technologies available at the beginning of the 21st century is foolproof, especially against a determined opponent.
- There are also many alternative business models.

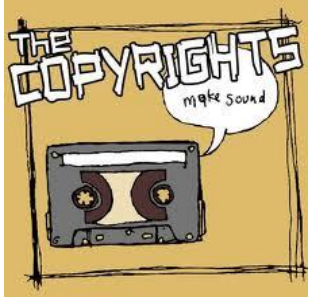
DRM in Video and Pay-TV

- **There were technical measures taken to prevent copying - such as the Macrovision system**

- **Hollywood became paranoid about video rental stores: but being able to rent videos greatly increased the number of VCRs, The business model has changed so that the cinema release is really just advertising for the sales of the video**

- **The advent of pay-TV, created a need for *conditional access* *mechanisms which would allow a station operator* to restrict reception of a channel in various ways**

DRM& Audio



- Pirates have also been copying music and other audio much longer than software.
- Cassettes turned out not to be a huge problem because the degradation in quality is noticeable on home equipment
- The introduction of *digital audio tape (DAT)* *caused the next worry, because* a perfect copy of the contents of a CD could be made.
- The eventual response was to introduce a *serial copy management system (SCMS)*
- This didn't work well, as the no-more-copies bit is ignored by many recorders and can be defeated by simple filtering
- Audio copying has become a headline concern again, thanks to the MP3 format for compressing audio.
- This led to the growth of the rights-management industry

Copyrights in Books

- After the invention of the novel, a mass market appeared for books, and circulating libraries sprung up to service it.
  - The publishers were frightened that the libraries would deprive them of sales

DRM in DVD

- **As usual, Hollywood took fright and said that unless DVD had a decent copy protection mechanism, first-class movies wouldn't be released for it**
- **A mechanism called the *content scrambling system (CSS)***
- **DVD has *region coding: it divides the world into five regions.***
- **A strong implementation of region coding was not in the vendors's interests**
- **In 1999, a California court enjoined the posting of DeCSS, one of the CSS decryption programs**
- **Even though there is coping, but it's not entirely trivial yet - even a DSL modem takes hours to send a 4Gb DVD movie to a friend, and PC disk space is also an issue.**