

Dude, where's my computer?

The dangers of DRM in a digital world



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Outline

- Origins of DRM
- The DRM approach
- DRM examples today
- Dude, where's my computer?

Origins of DRM

What is DRM?

— Digital *Rights* Management

What is DRM?

— Digital *Rights* Management

— Digital **Restrictions** Management.

Where is DRM?

- Films
- Music
- Software
- Documents
- Hardware!

The origins of DRM – Timeline

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3. Media files (WMA, WMV, AAC, etc.)
 - Affects: Computers (software), External media players
4. HD-DVD, BluRay (Regions, AACS, HDCP)
 - Affects: Computers (**operative systems, hardware**), External media players

The DRM approach

Goals of DRM

- Make every interaction with a published work into a transaction
- Sell you the same things many times!
- Keep you from owning the content you buy
- Imposing differential prices (DVD Regions)

DRM opens new marketing possibilities

Imagine...

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Imagine...

- A CD that can only be played on your birthday
- A book that can only be read once
- Documents that can only be read inside your office
- A computer that obeys movie makers, and not you
- A movie that cannot be played outside of your country

DRM affects your personal freedoms

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- All your documents can become unreadable if you don't pay for the newest software version
- Incriminating documents can be erased by your boss
- Media and software companies decide what you can do with a computer
- DRM software monitors your behaviour
- YOU are the enemy of DRM and no longer control your devices or data

DRM affects your personal freedoms

“We came at this thinking about music, but then we realized that e-mail and documents were far more interesting domains.”

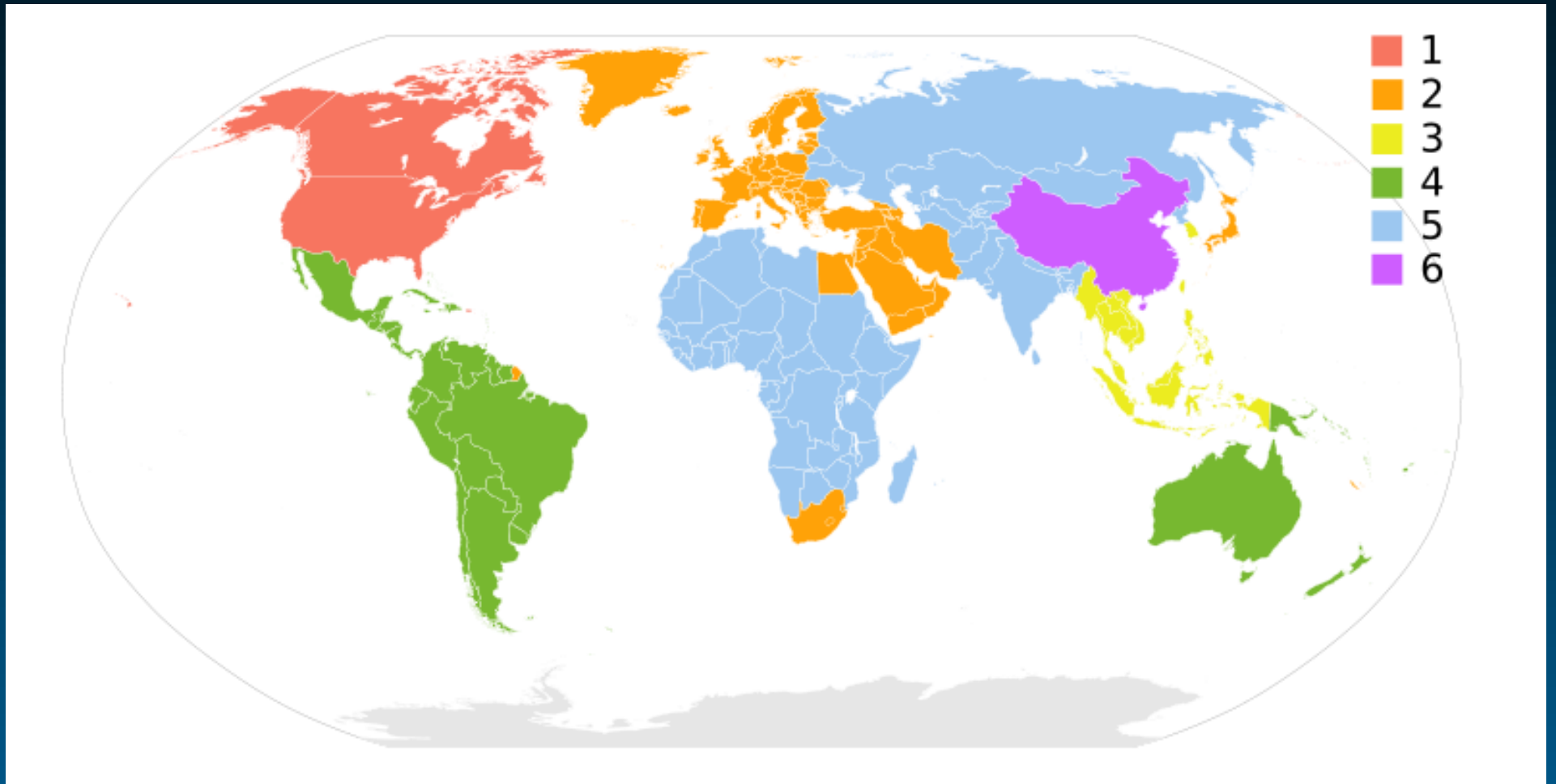
–Bill Gates



DRM examples today

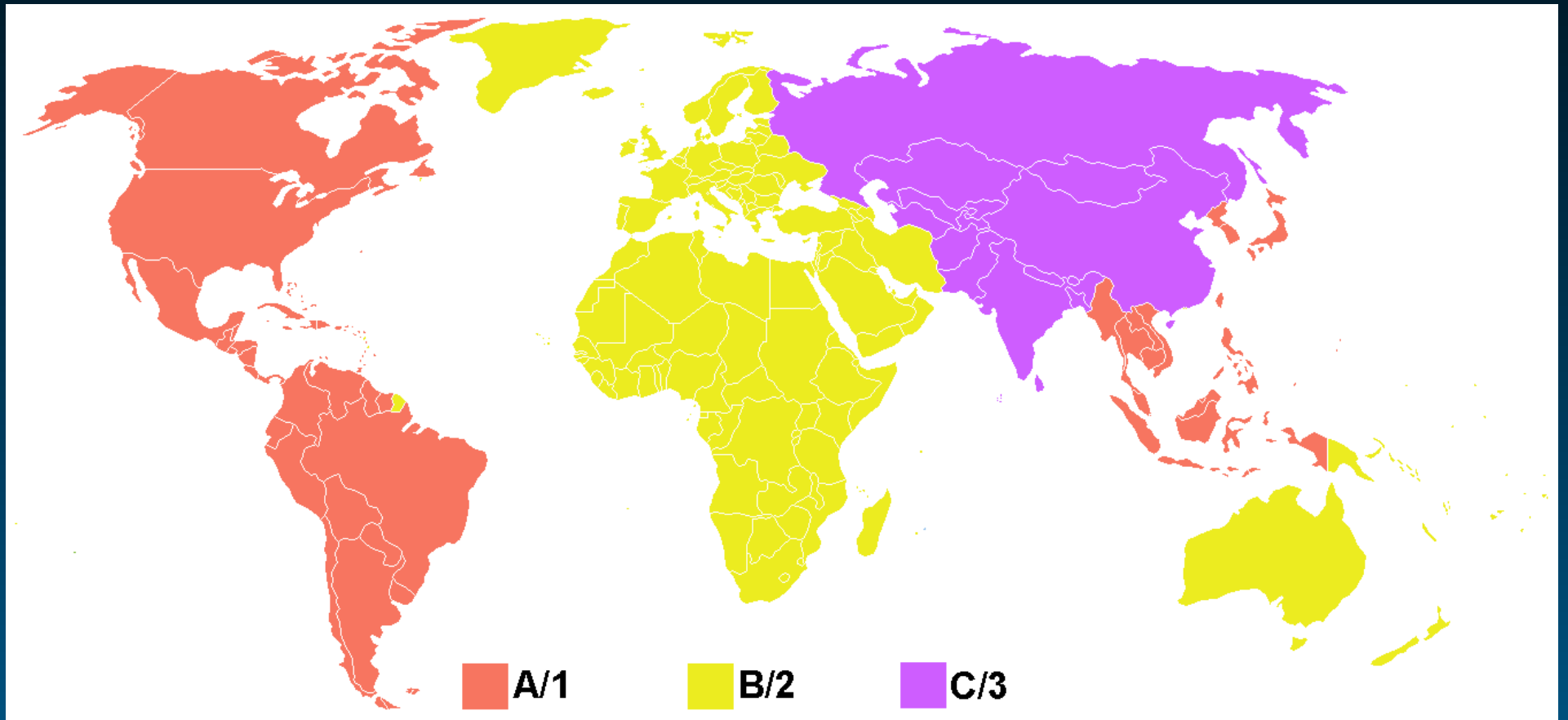
BluRay and HD-DVD: Regions

DVD Regions

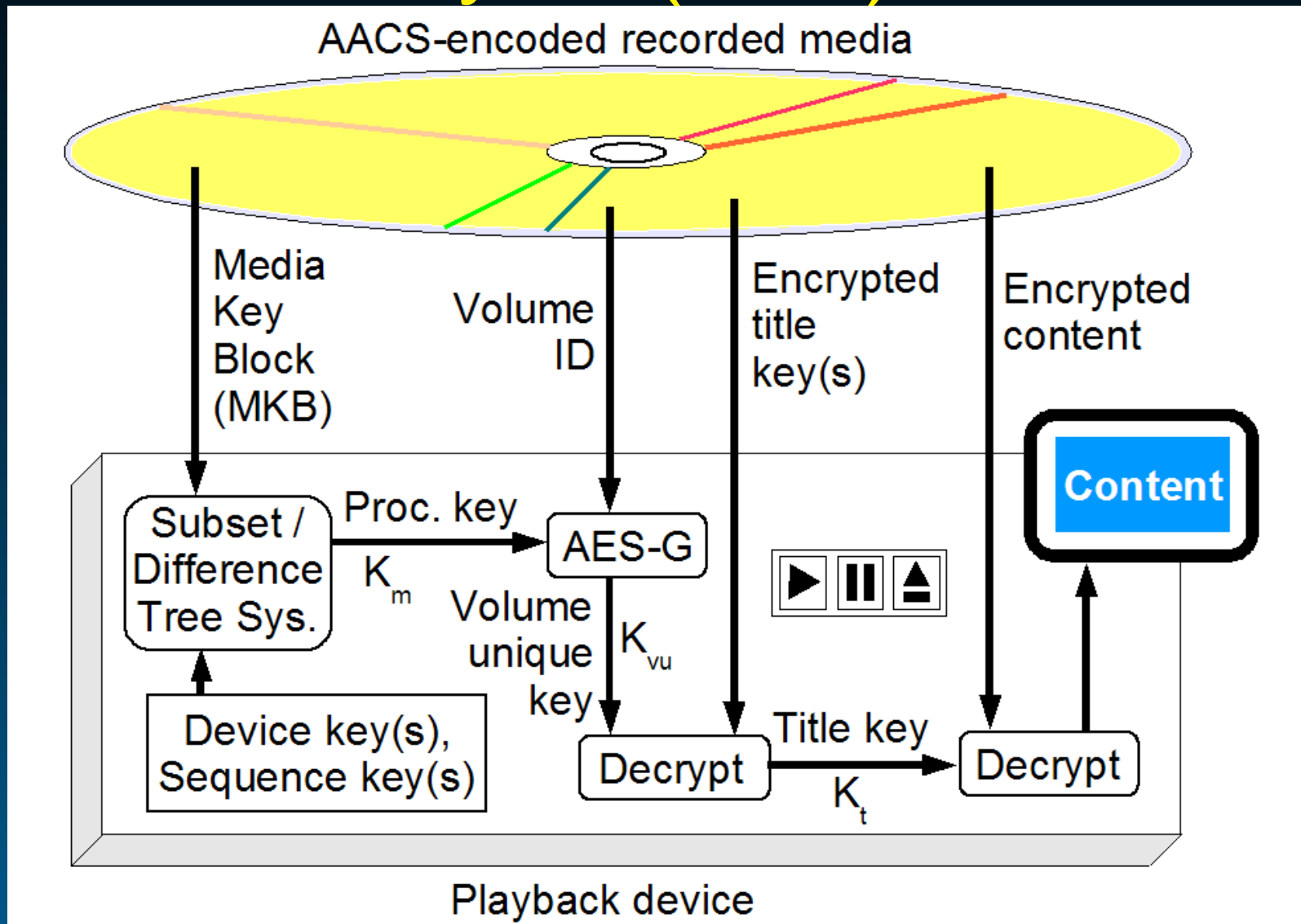


BluRay and HD-DVD: Regions

BluRay Regions



BluRay and HD-DVD: Advanced Access Content System (AACS)



- Major differences to DVD (CSS): HDCP + device keys can be revoked

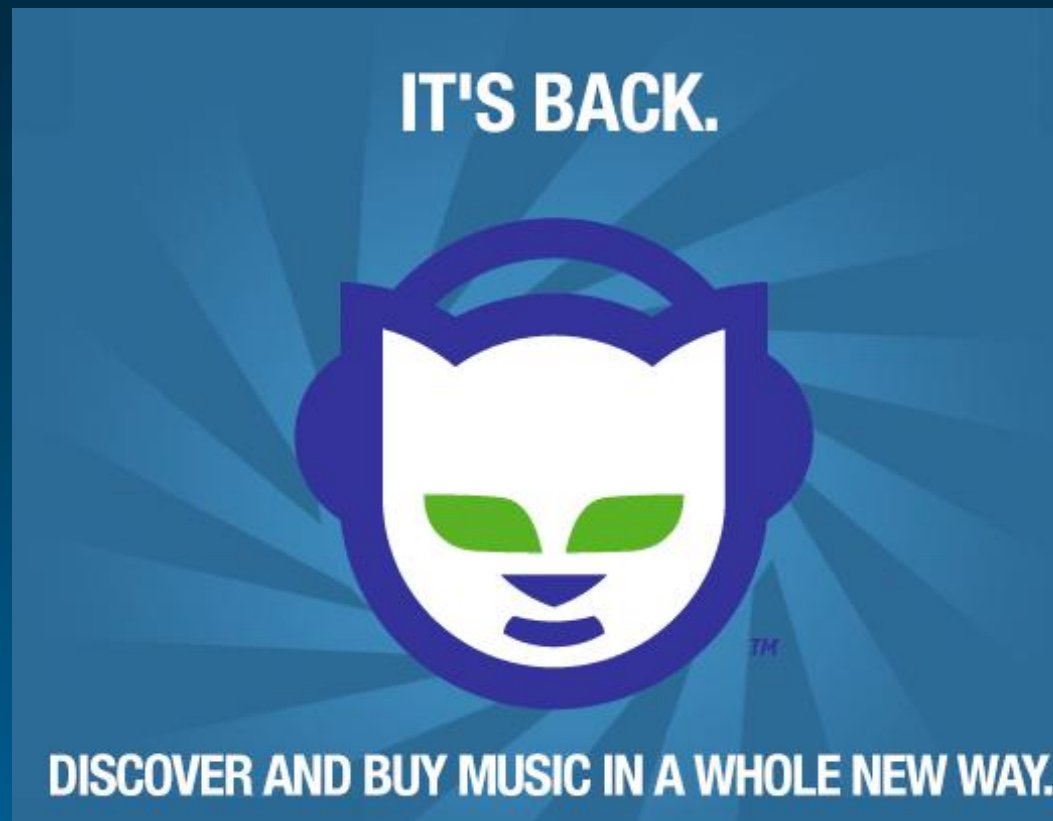
Apple iTunes DRM

- AAC files with DRM
- iTunes store limits the number of devices the songs can be played on.
- Apple can change at any time your rights to the songs you bought
- Copy limit has already been pushed down (10 to 7)
- Songs only play in iPod



Napster 2.0 DRM

- Windows Media Audio (WMA) files with DRM
- Paid subscription service
- Miss a monthly payment, all downloaded music files unusable.



Amazon Unbox (USA only)

- Windows Media files with DRM
- User agreement requires to allow DRM software to monitor your computer:
 - ★ A list of all the software installed
 - ★ All the music and video you have
 - ★ Your computer's interaction with other devices
- Remove DRM software and movies no longer work
- Move outside of the USA and movies no longer work



Sony BMG rootkit

“The industry will take **whatever steps it needs to protect itself and protect its revenue streams** (...) It will not lose that revenue stream, no matter what (...) Sony is going to take **aggressive steps** to stop this. We will develop technology that transcends the individual user. We will firewall Napster at source – we will block it at your cable company, we will block it at your phone company, we will block it at your ISP. We will firewall it at your PC (...) These strategies are being aggressively pursued because **there is simply too much at stake.**”

–Steve Heckler, senior vice-president of Sony Pictures Entertainment (August 2000)

Sony BMG rootkit

- In 2005, music CDs from Sony included malicious (rootkit) software called XCP
- DRM software automatically installed and hidden
- Copy prevented, but security holes and spyware introduced
- Information about your musical habits sent to Sony
- Viruses and trojans took advantage of this software
- If software manually removed, hard drive not recognized

Sony BMG rootkit

“Most people, I think, don't even know what a rootkit is, so why should they care about it?”

–Thomas Hesse, Sony BMG's Global Digital Business President



Windows Vista

- Vista \approx XP + DRM

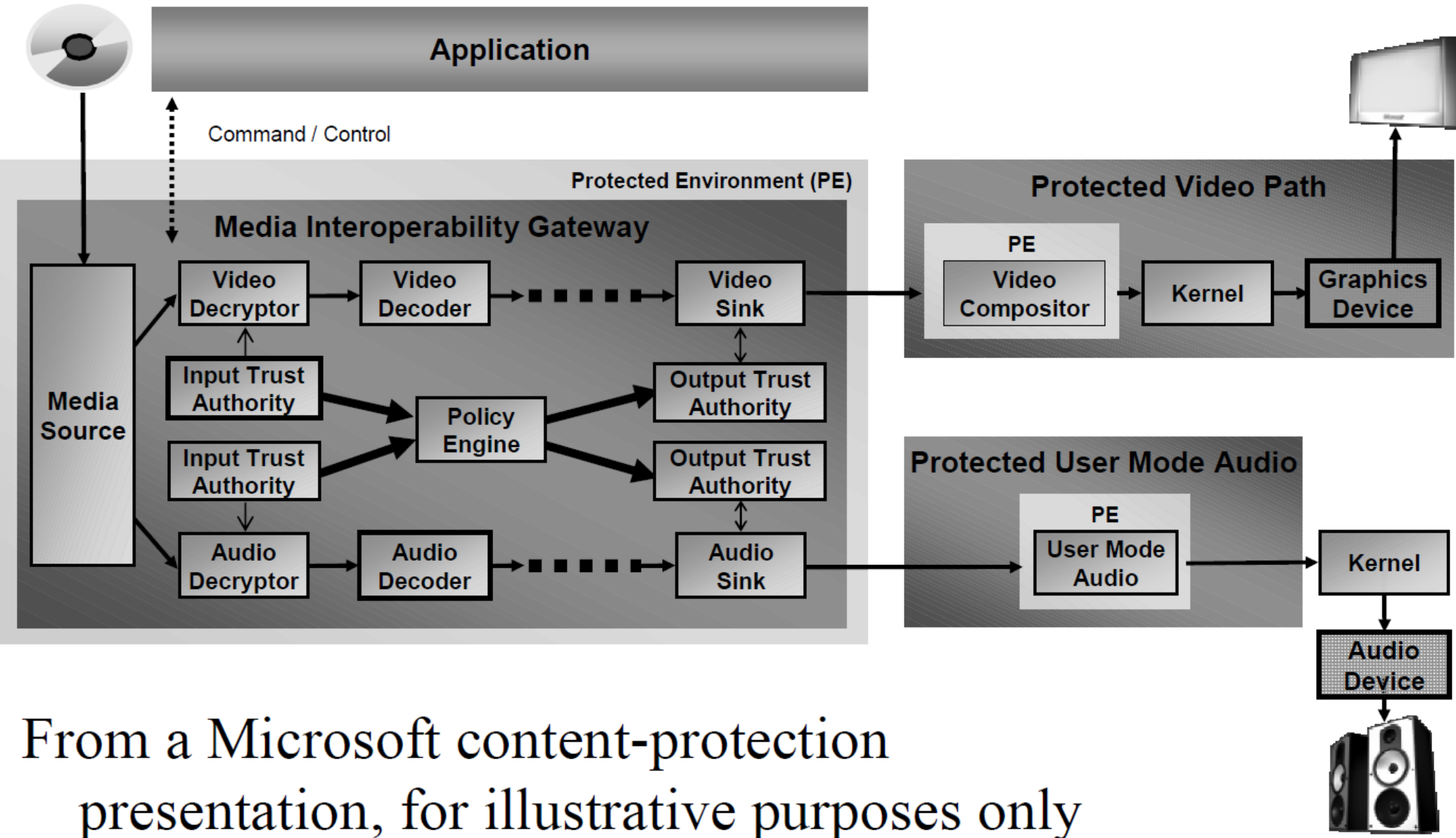
Windows Vista

- Vista \approx XP + DRM
- High-bandwidth Digital Content Protection (HDCP)
- Protected Media Path (PMP)
- Driver revocation disables “bad” devices

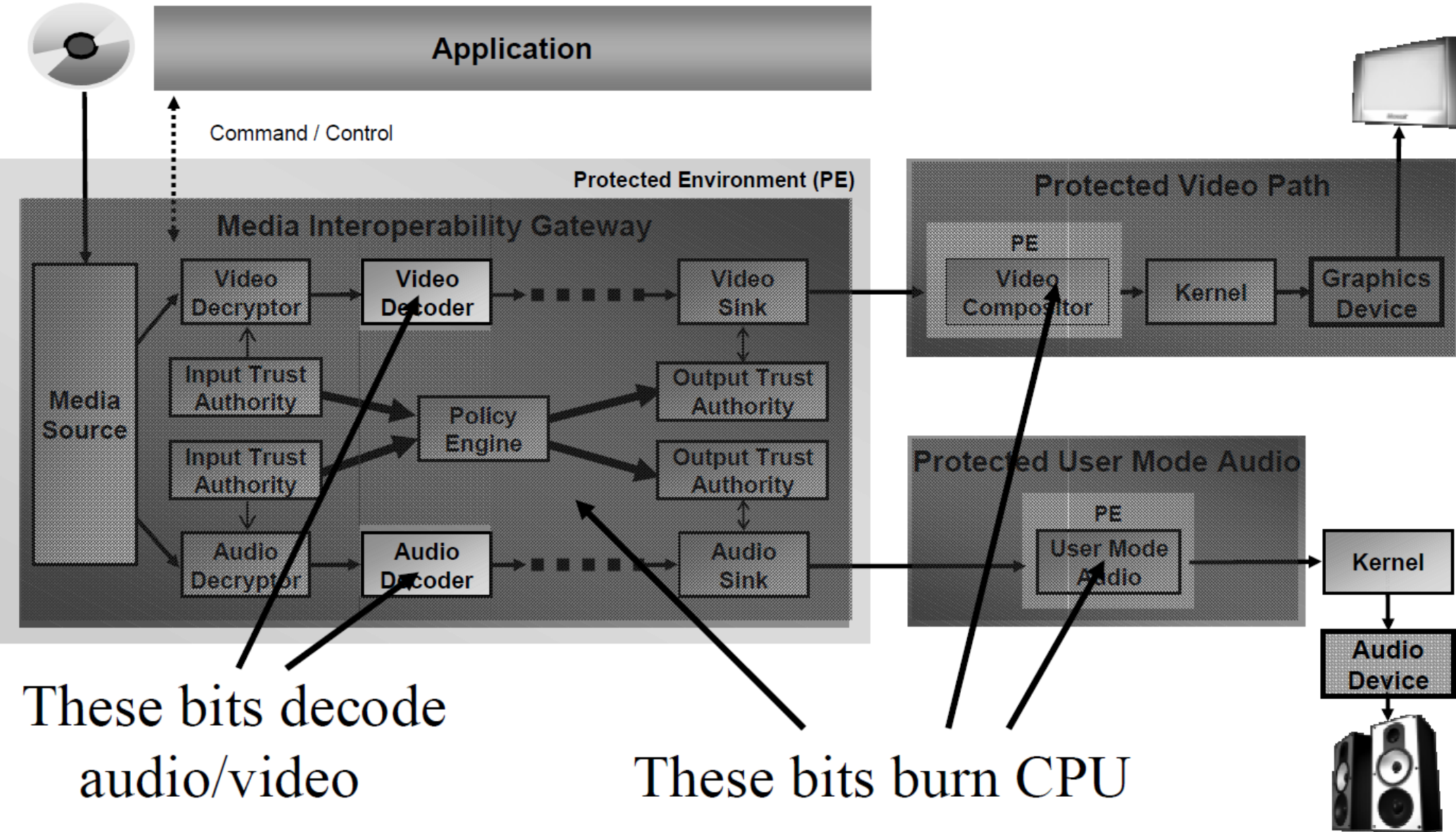
Windows Vista

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- High-bandwidth Digital Content Protection (HDCP)
- Protected Media Path (PMP)
- Driver revocation disables “bad” devices
- Increased costs! (CPU and \$\$\$)
- Designed by Hollywood studios





From a Microsoft content-protection presentation, for illustrative purposes only



Windows Vista: What Happened to non-protected outputs?

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- S/PDIF

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- Monitor/Video Card without HDCP:
DISABLED or **DOWNGRADED**
- Driver revocation: non-compliant hardware will be disabled in the next Windows Update!

Windows Vista: Increased Hardware and CPU costs

“The PC industry is committed to providing content protection on the PC, but nothing comes for free. These costs are passed on to the consumer”

–ATI

“The evidence [of security] must be presented to Hollywood and other content owners, and they must agree that it provides the required level of security. **Written proof from at least three of the major Hollywood studios is required.**”

–Microsoft White Paper (“Output Content Protection and Windows Vista”)

Windows Vista: Serious trouble for Open Source!

- Signed drivers a problem (**mandatory** in Vista 64-bits)
- Manufacturers required to sign content-protection license:
 - ★ “There is no requirement to sign the [content-protection] license; but without a certificate, no premium content will be passed to the driver” –Microsoft White Paper (“Output Content Protection and Windows Vista”)
- Technical details of output devices must be kept secret (no Open Source drivers!)

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- Big media corporations actually control your computer
- Big software companies increase their monopolies
- Everyone wins, except you!



What can you do?

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- Boycott products with DRM
- Boycott HD-DVD and BluRay
- Downgrade Vista
- Be aware to DRM (and especially to buying hardware)

Sources and more information

- Peter Gunman's "A Cost Analysis of Windows Vista Content Protection":
 - ★ www.cs.auckland.ac.nz/~pgut001/pubs/vista_cost.html
- www.gnu.org/philosophy/right-to-read.html
- www.defectivebydesign.org
- badvista.fsf.org
- drm.info
- w2.eff.org/IP/DRM/guide



Credits: Alfredo Rezinovsky