

# Digital Rights Management in Television

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# Issues

- The constraints and business needs of commercial broadcasters
- The constraints and business needs of subscription broadcasters
- General requirements of digital rights management
- “Open boxes”
- Implementation of the “broadcast flag”
- The Analogue Hole
- Keeping PVRs and set top boxes connected to the television
- Balancing the needs of viewers with those of rights holders

# The constraints and business needs of commercial broadcasters

- The business of commercial television is the sale of advertising
  - Consumers watch advertisements in return for the programming
  - Programming is designed to entertain, inform or educate – advertising (from the BSA) is other than this!
- Commercial broadcasters buy and produce programming
- Drama (especially movies) is often acquired from the major studios
- The move to digital means that the technical model for commercial broadcasting has changed from delivering the best possible quality video and audio “up the stick” to delivering it to the home
- Subscription broadcasters have complete control over their consumer equipment and can use proprietary standards
- The studios are concerned that their rights may be infringed if these perfect copies are distributed by the Internet (or burned to DVD)

# The constraints and business needs of subscription broadcasters

- The business of subscription television is the sale of television programming
  - Consumers watch the service in return for subscription fees
- Subscription broadcasters buy and produce programming
- Drama (especially movies) is often acquired from the major studios
- The move to digital means that the technical model for subscription broadcasting has changed from delivering the best possible quality video and audio to the cable head end to delivering it to the home
- Commercial broadcasters have little or no involvement in consumer equipment except through standards committees
- The studios are concerned that their rights may be infringed if these perfect copies are distributed by the Internet (or burned to DVD)

# General requirements of digital rights management

- Effective and Robust
- Applicable to a wide range of content and business models
- Easy to Use for Consumers (transparent to end user)
- Renewable – If hacked, a new, secure measure can be substituted without rendering legacy devices useless
- Reasonable Cost
- Easy compliance – need means to ensure people play by the rules

# General requirements of digital rights management

- Set of technologies that enable content owners to specify and control the
  - access they want to give consumers
  - conditions under which it is given
- DRM includes:
  - **Persistent Protection:** Technology for protecting files via encryption and allowing access to them only after the entity desiring access has had its identity authenticated and its rights to that specific type of access verified
  - **Business rights:** Capability of associating business rights with a content by contract
  - **Access tracking:** Capability of tracking access to and operations on content
  - **Rights licensing:** Capability of defining specific rights to content and making them available by contract

# “Open boxes”

General Purpose Computer



→ Less secure

- User Programmable
- Software-based Operating System
- Software-based Protection
- Less Tamper Resistant
- Few Licensing Obligations

Dedicated Hardware



→ More secure

- Non-user Programmable
- Hardware-based Operating System
- Hardware-based Protection
- More Tamper Resistant
- Many Licensing Obligations

# “Open boxes”

- PCs expose decrypted, DRM-delivered content to unauthorised copying/redistribution when content passes across a user-accessible bus to video/audio peripherals
- PCs generally use no copy-protected links to displays to protect analogue video signals from being re-digitised, copied, and redistributed
- PCs have no built-in security to bind the DRM to the PC hardware  
DRM robustness is directly related to the quality of the tamper resistant software techniques
- DRM protection is tied to integration in proprietary media players, device drivers, and operating systems

# “Open boxes”

- Secure and Insecure Environments for the digital delivery of content. In the dedicated hardware world, the distribution of circumvention tools is more difficult. In the software world, hacks can be downloaded
- For digital rights management, it is not really about the delivery mechanism – the issue of security is the architecture of the platform – it arises in the PC once the content has been delivered
- Unresolved security issues are preventing PCs from becoming “trusted devices” thereby limiting the potential for digital rights management to deliver high-value content to PCs

# The Analogue Hole

- Digital protection works in digital environment.
- Analogue signal in a TV set
- Converted back to digital – no protection.
- PC analogue capture cards
- Consensus watermark.

# Implementation of the “broadcast flag”

- The “broadcast flag” is simply a bit set in the System Information that indicates that the video stream has been broadcast rather than originates from any other source
- It is only of value to rights holders if there is a mandated scheme that all consumer devices recognise that broadcasts may not be copied to other devices
- If the digital environment is not secure then it is difficult to implement detection in order to gain benefits. That is, there is a need for baseline security

# Keeping PVRs and set top boxes connected to the television

- Both commercial and subscription broadcasters have a motivation to keep PVRs and set top boxes connected to the television (and not to the Internet):
  - The delivery of content, particularly high definition and high quality audio content, depends on the studios and it is the studios are looking for protection
  - From the commercial broadcaster perspective – television eyes, the ratings, are key
  - From the commercial broadcaster perspective – television eyes, customer loyalty, is key
- Closed devices benefit both types of broadcaster – subscription broadcasters are in a better position to determine the outcome

# Balancing the needs of viewers with those of rights holders

- Currently, viewers can time-delay their television watching using an (analogue) video cassette recorder or an analogue source fed to a DVD recorder
- The emphasis is on time delay rather than redistribution (even if “borrowing” of tapes goes on)
- The challenge facing broadcasters is to allow this time shifting in the future without endangering the supply of programming:
  - Australian regulation of consumer devices is much less interventionist than the USA
  - Subscription broadcasters have a level of control (for example, local encryption of programming on the hard disks on BSkyB PVR)
  - Commercial broadcasters need to see the adoption of closed digital PVR and DVD recorders that allow time shifting but not copying

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