

Content Management for Freeview HD

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Overview

- Context
- Broadcaster Requirements
- D-Book Solution
- “Encoding Rules”
- Example programmes
- International context and EBU
- Lookup Table Licence
- Impact on Receivers
- Discussion

Context: Why Bother?

- Why bother with Content Management for “free-to-air”?
 - A degree of Content Management required by content owners in order to secure most valuable HD programmes
 - If no restriction on anyone redistributing their content, it could diminish potential market to license the works elsewhere:
 - provides less money for producing higher quality programs.
 - Gives content producers incentives to offer consumers early and free access to more content, including content that would only be available elsewhere on pay subscription channels.
- Broadcasters could say “no” to request, but respecting request for content protection should result in a better viewing experience for the UK consumer.
- Already in place on Freesat, Sky and Virgin
- Freeview true “horizontal” market
 - Industry consensus required
 - Rugged and open conformance regime required

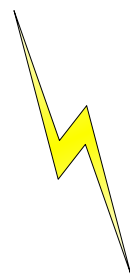
Broadcaster Requirements

- For the purposes of *time-shifting*:
 - it shall always be possible to record HD content onto internal or external storage “bound” to receiver.
- To facilitate *format-shifting*:
 - **it shall always be possible to make “standard definition” copies of HD content.**
 - it should always be possible to make at least one HD copy on Blu-ray.
- To manage copying of HD content onto removable media such as Blu-ray
- To manage Internet redistribution to respect territorial restrictions under licence agreements
- Content Management should largely be invisible to legitimate users
- There is no requirement to manage copying of standard definition broadcast content

Summary of D-Book Proposal

- Based on industry standards:
 - DVB “FTA Content Management Descriptor” (EN 300 468 v1.9.1) signalling
 - HDCP encryption for displays
 - AACs encryption for Blu-ray
 - DTCP-IP encryption for home networks
- Three Content Management states signalled on a per-event basis:
 1. “Free Access - No Encryption”
 - Programmes can be freely copied within the home without restriction,
 - Programmes can be Uploaded/streamed over the Internet without any restrictions
 2. “Free Access - With Encryption”
 - Programmes can be freely copied within the home without restriction,
 - Upload/streaming over the Internet is blocked.
 3. “Managed Copy”
 - One HD copy in addition to the copy stored on a PVR is allowed,
 - The additional copy can be onto a device connected to a home network or Blu-ray disc,
 - A copy on the home network may be moved on to Blu-ray,
 - Programmes can be viewed across a home network without restriction,
 - Upload or streaming over the Internet is blocked,
 - No restrictions on SD copies of HD content.
- Conformance ensured through link to BBC Huffman string compression “Lookup Table” licence

DRM in the Home



Main HD Receiver
HDD & Blu-Ray Recorder

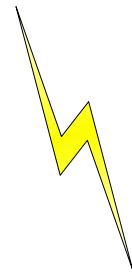


Direct connection to TV
HDCP

Main HD Receiver
HDD & Blu-Ray Recorder



DRM in the Home



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HDD & Blu-Ray Recorder



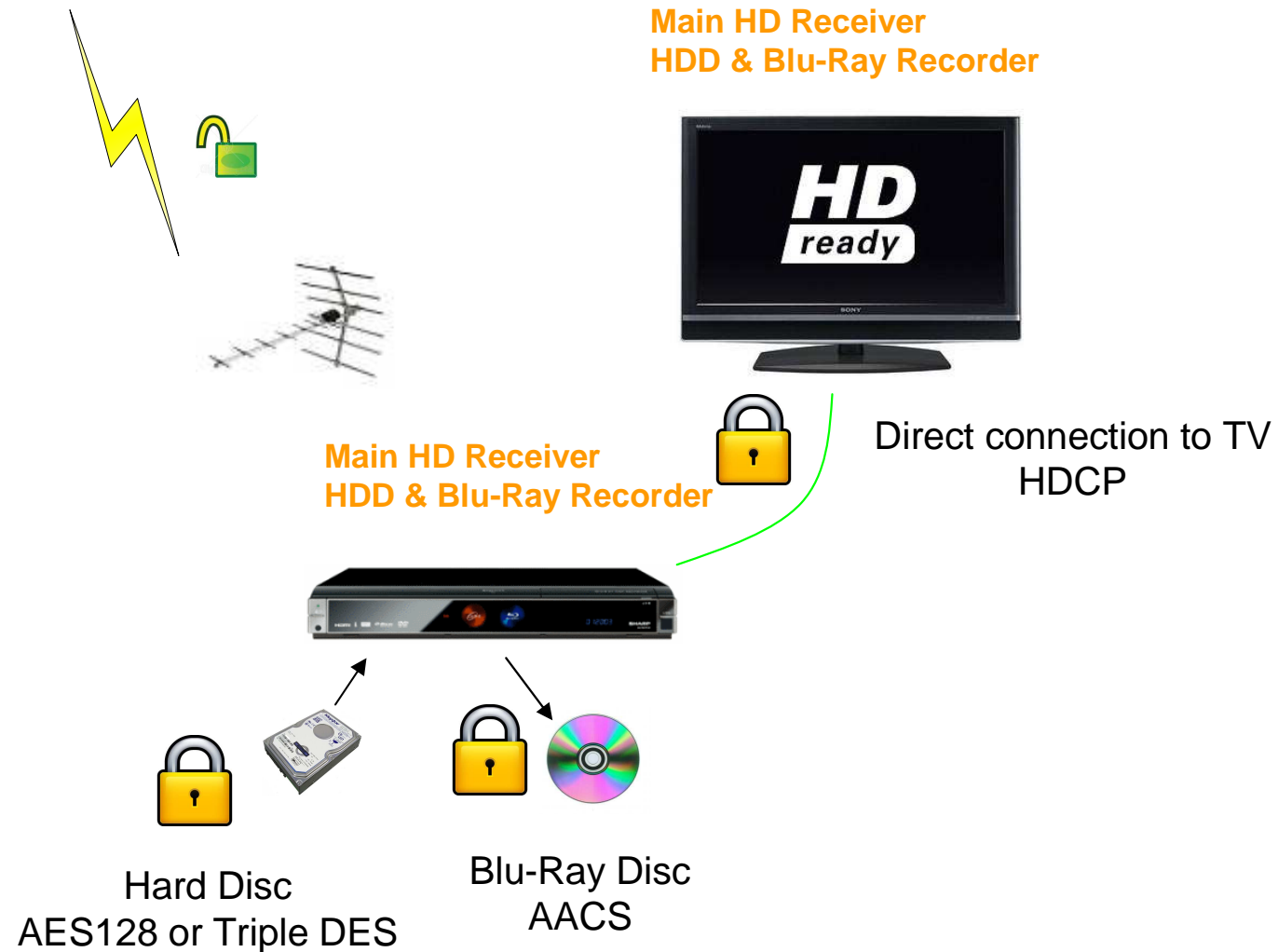
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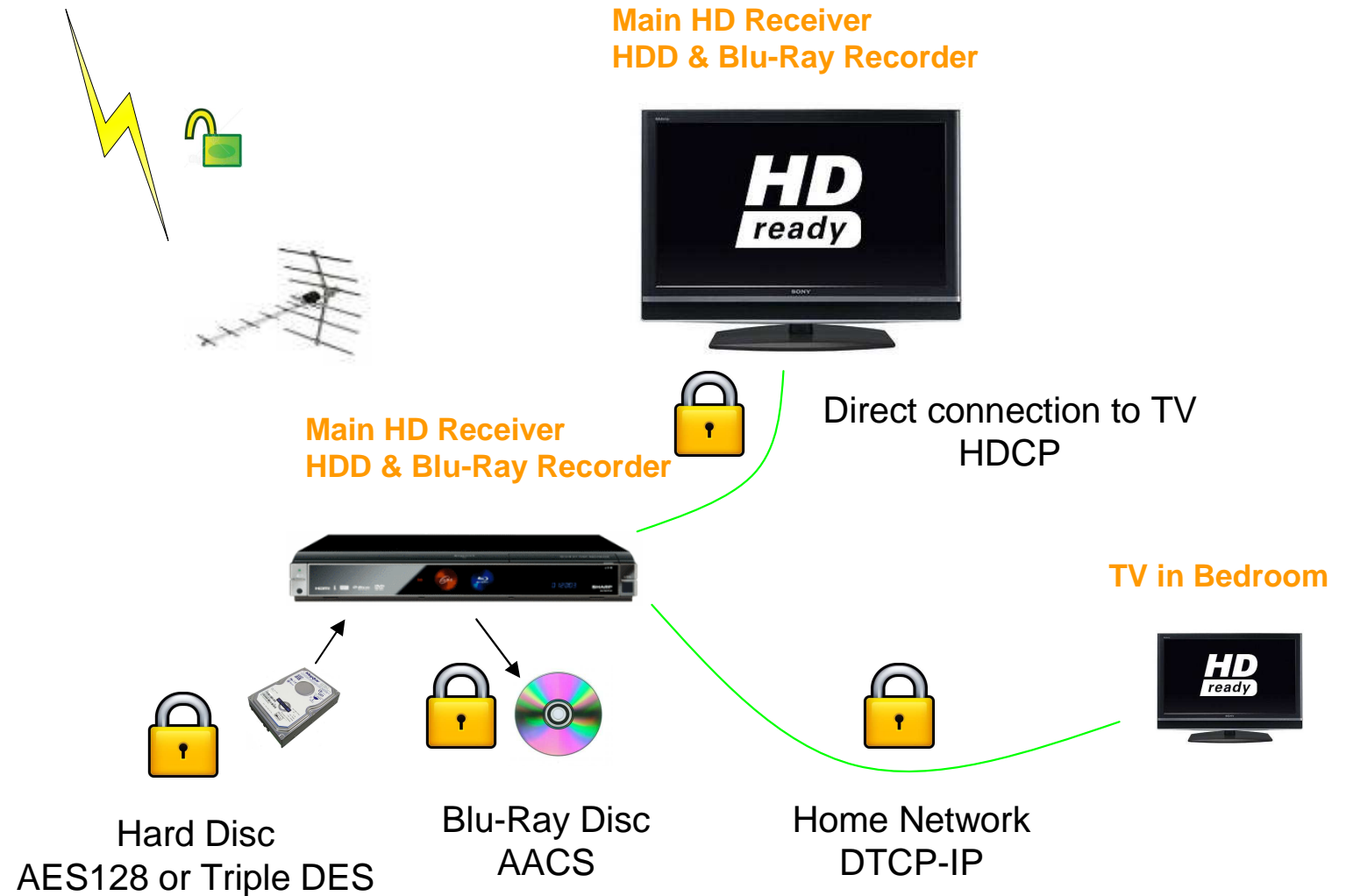


Blu-Ray Disc
AACs

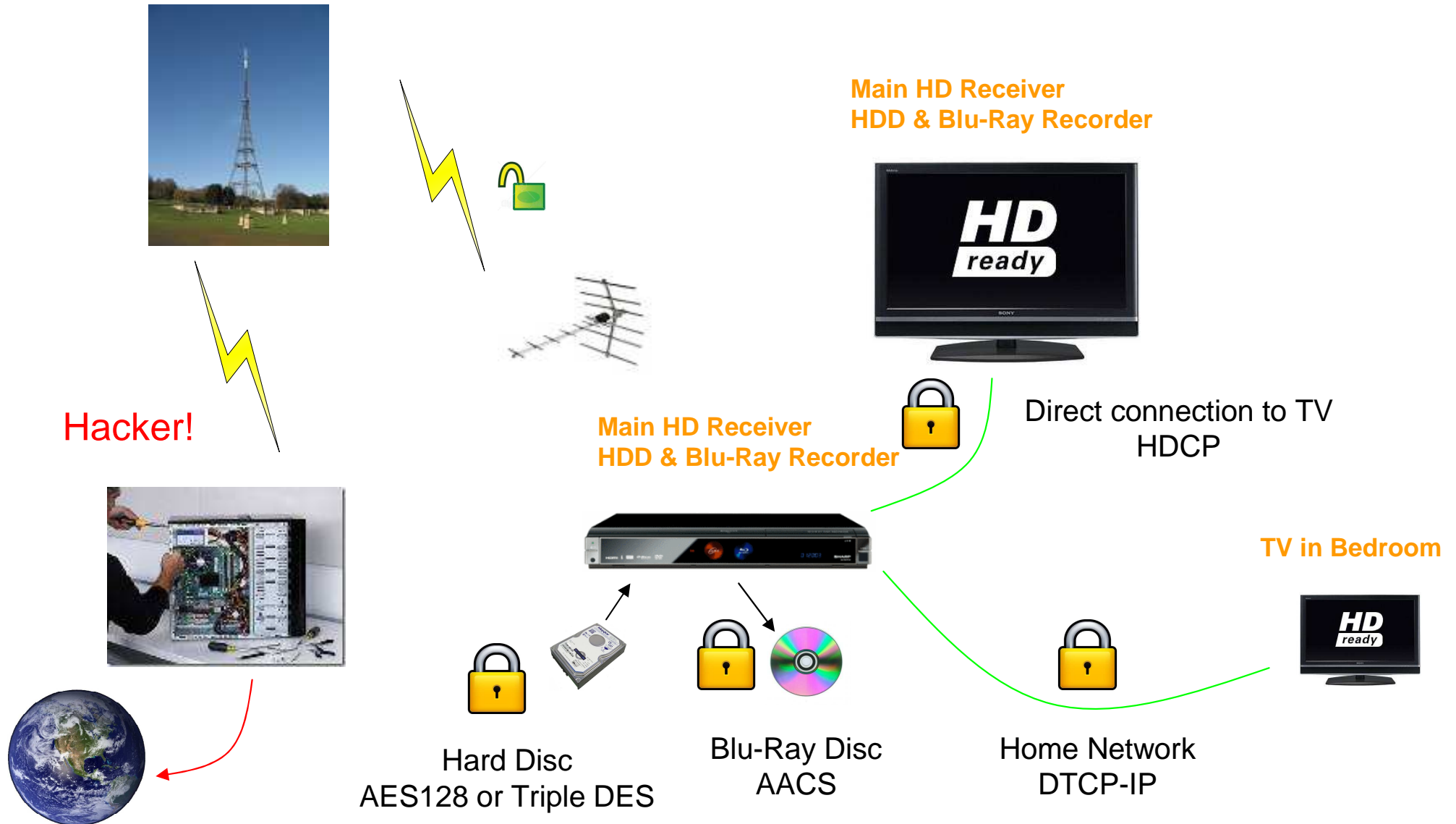
DRM in the Home



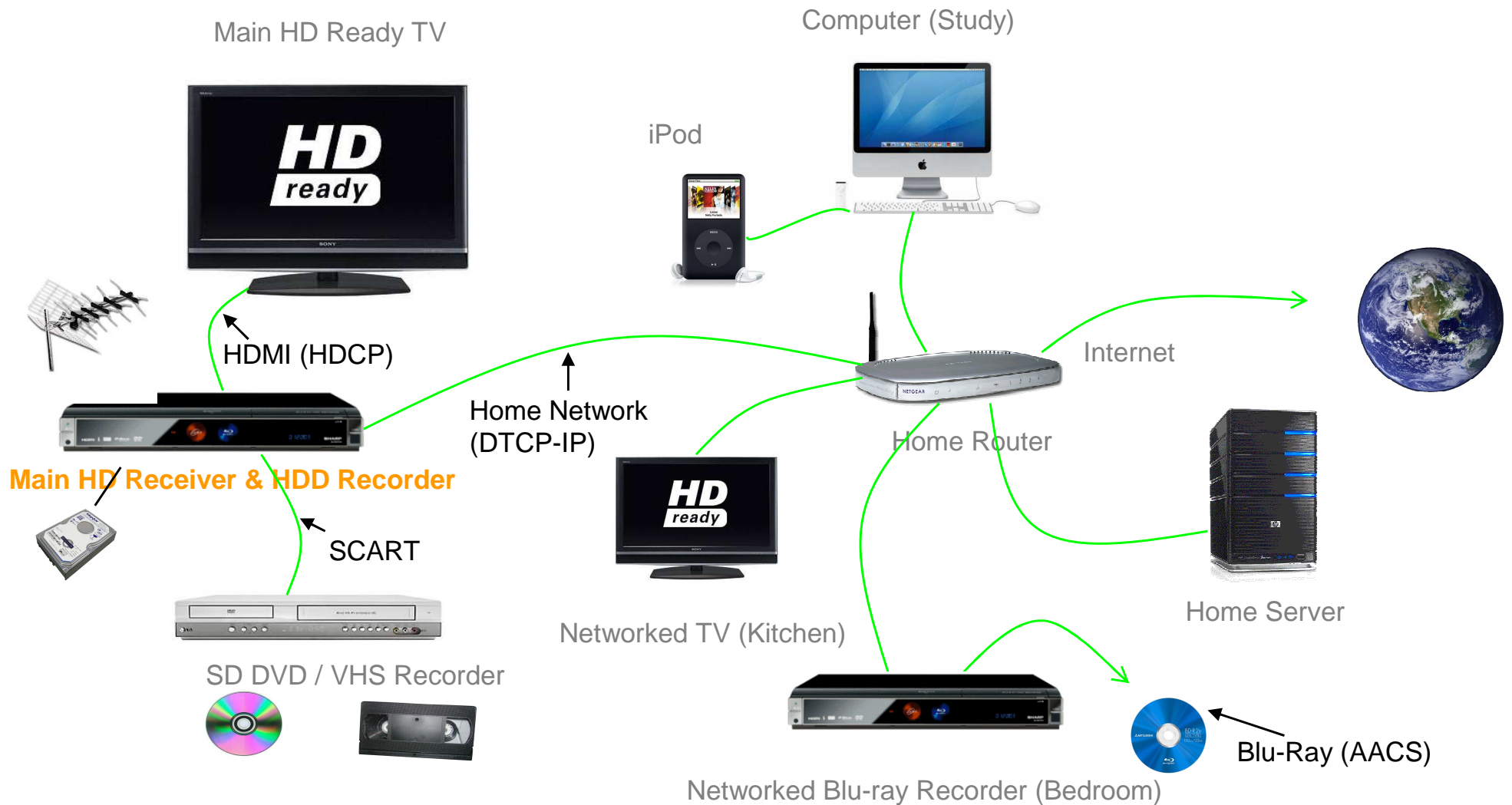
DRM in the Home



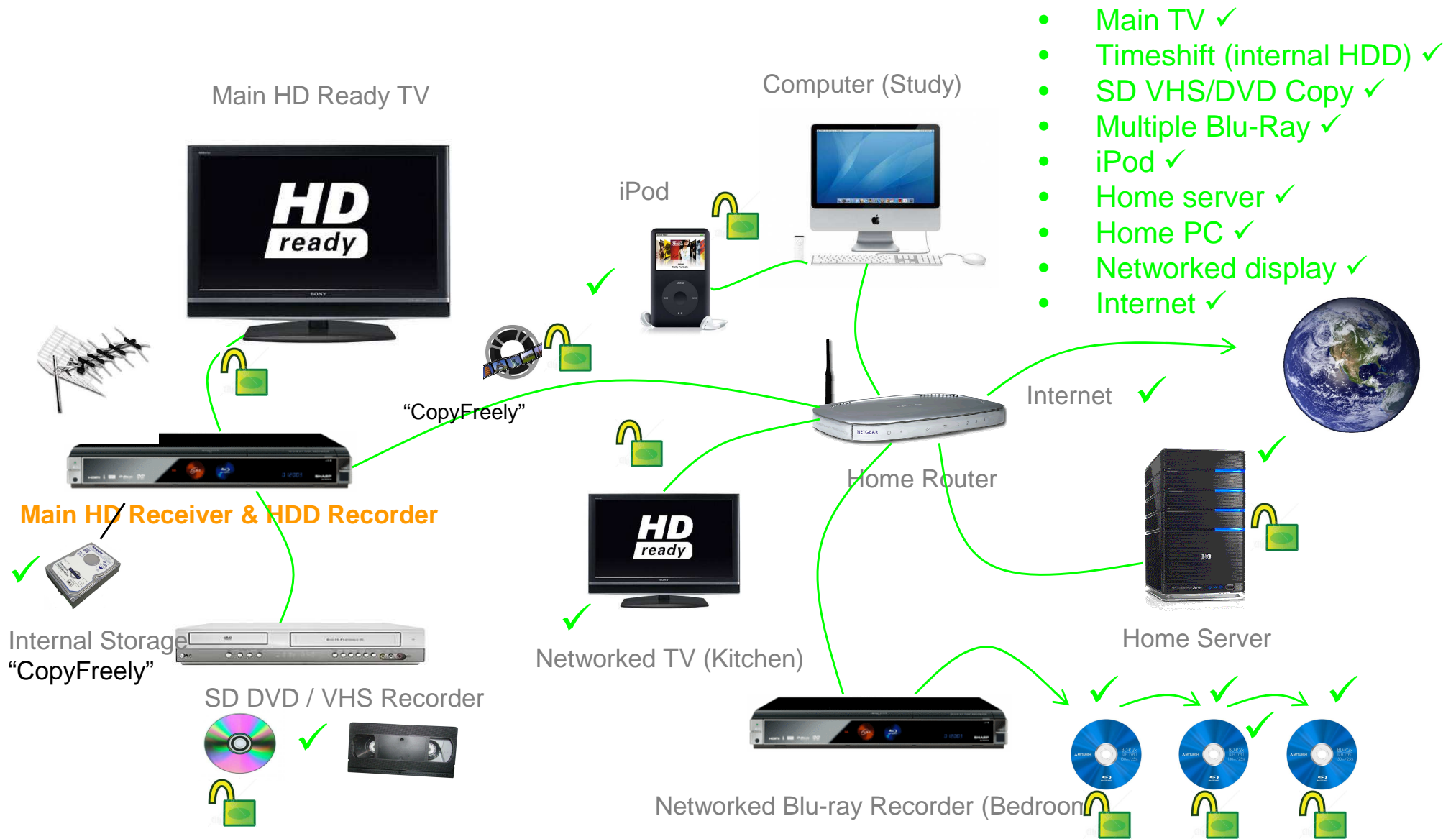
Can't stop "hackers"



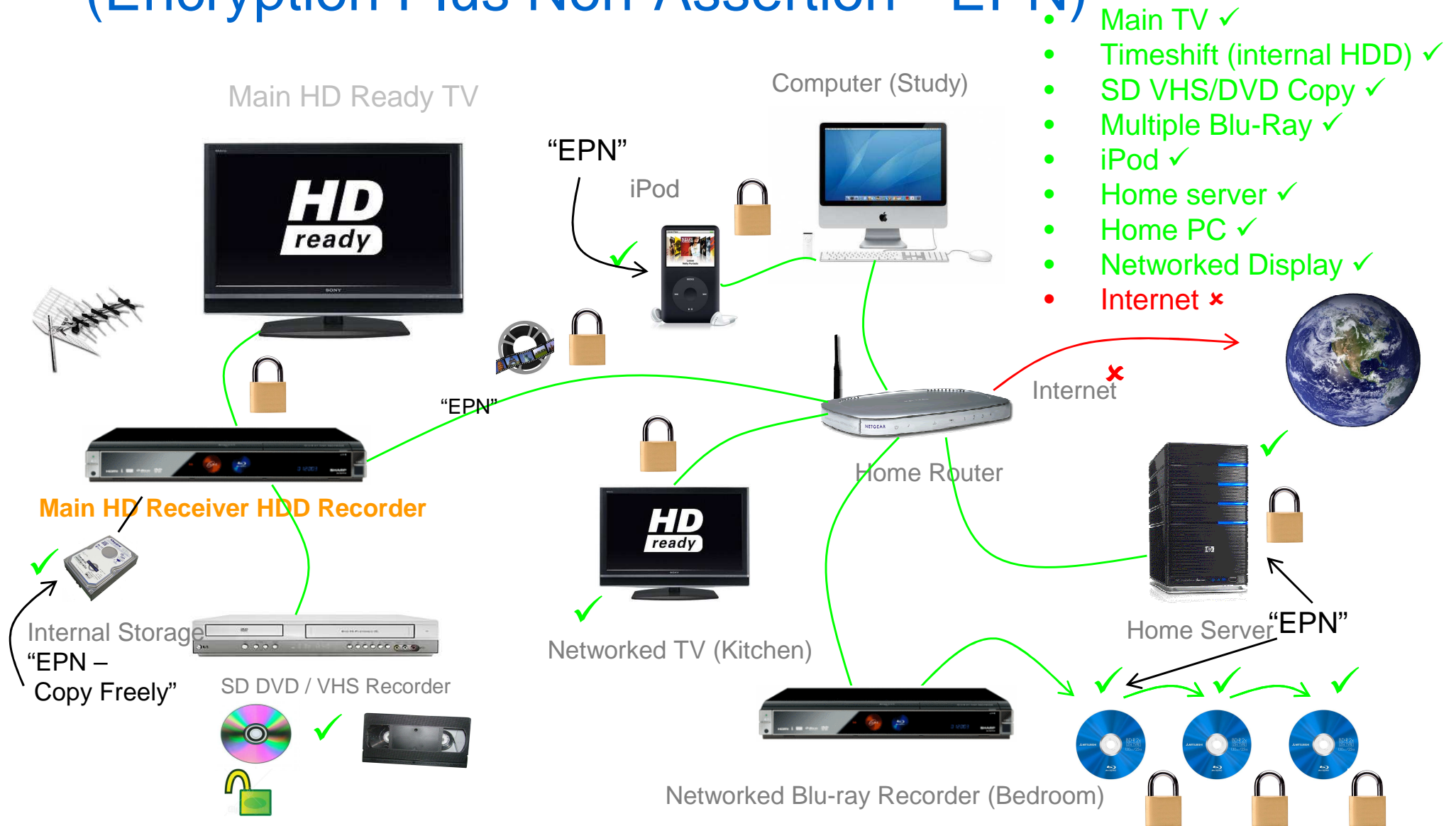
How D-Book Proposal Would Work



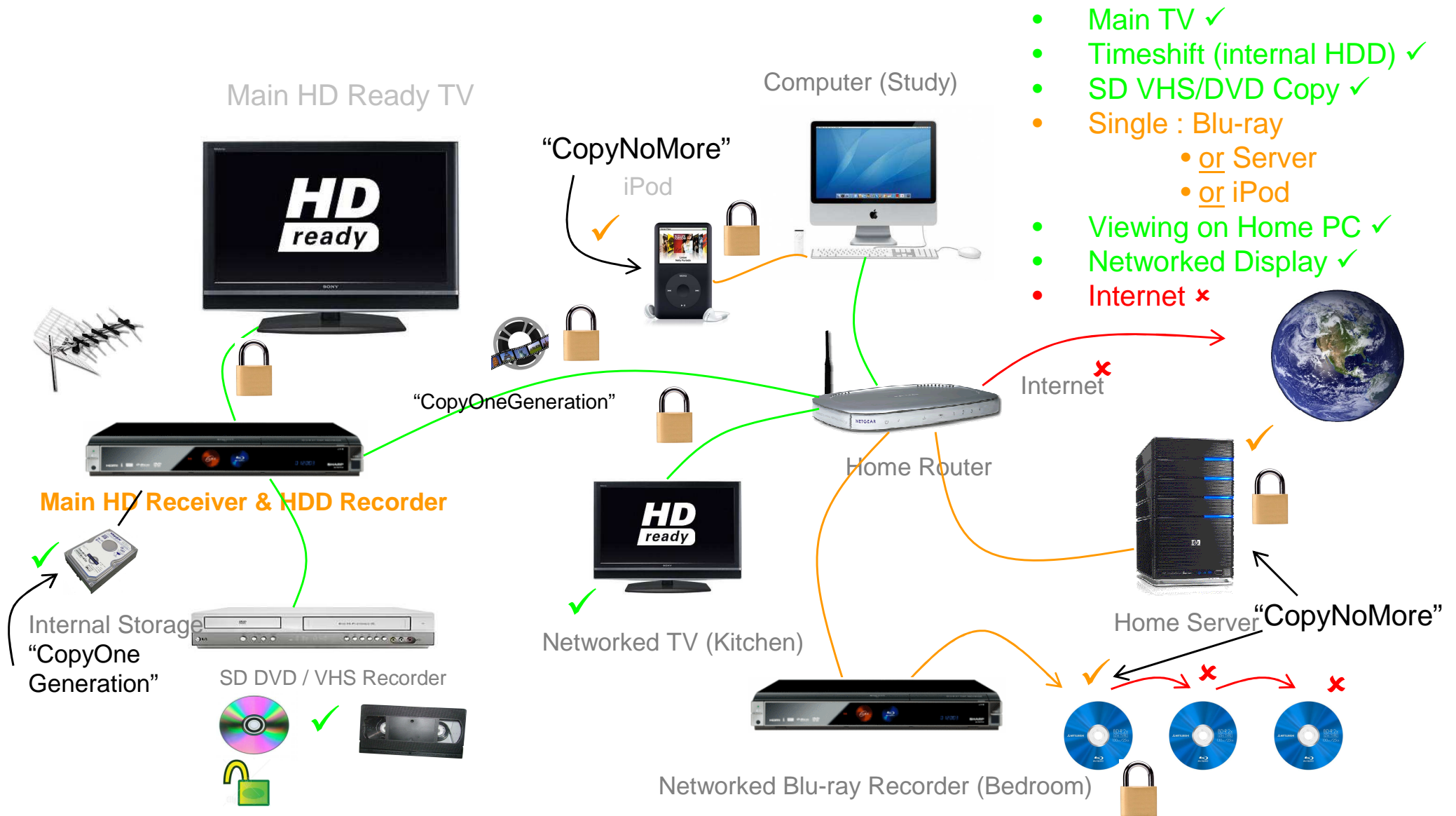
1. Free Access – No Encryption



2. Free Access with Encryption (Encryption Plus Non-Assertion - EPN)



3. Managed Copy (Copy One Generation)



Impact on Consumers

- Vast majority of consumers will never even know content management is there:
 - they will not be prevented from normal viewing
 - they will not be prevented from recording on DVRs, DVD recorders and new Blu-Ray recorders
 - The only actions that will be prevented are:
 - retransmitting the content over the internet
 - or, in some cases, from making more than one digital copy of the highest-value content on Blu-ray
- As a comparator:
 - How many viewers are aware that DVD films are scrambled?
 - How many SkyHD, Freesat HD and VirginMedia V+ viewers are aware that the signal on the HDMI lead to their TV's is encrypted?

DTLA Draft Encoding Rules: “Copy One Generation”.

Content Participant may encode, or direct to be encoded, using DTCP Copy One Generation encoding:

- a. content that previously has been available only in theatrical release or only on Prerecorded Media in any country of the world, and has not previously been licensed for television broadcast in any country of the world; or,*
- b. content that --*
 - I. was transmitted in any country of the world over –*
 - A. Video on Demand, Pay-Per-View, Subscription-on-Demand, or Undefined Business Models that are comparable to the foregoing, or*
 - B. Pay Television Transmissions, and*
 - II. has not been broadcast in any country of the world in greater than Standard Definition format without using one or more copy protection methods, including but not limited to DTCP encoding.*

DTLA Draft Encoding Rules - Encryption Plus Non-assertion (“EPN”)

Content Participant may encode, or direct to be encoded, using DTCP EPN encoding:

- a) content that may be encoded using DTCP as Copy One Generation pursuant to section 1,*
- b) content originally produced for broadcast over the Freeview HD system (including content that may be simulcast in the United Kingdom over both Freeview HD and other High Definition transmission platforms using one or more content protection methods, including but not limited to DTCP),*
- c) content that has not previously been broadcast in greater than Standard Definition format in any country of the world; or*
- d) High Definition content that has been broadcast only with content protection (i.e., that has not been broadcast in any country of the world without using one or more content protection methods, including but not limited to DTCP encoding).*

HD Platforms Overseas

- Largely English language problem as series “air” earlier than dubbed versions
- EBU solution blocked by Germany
 - opposed to any form of encryption after reception
 - believe compromise may be possible by using “spare” signalling bits
- Requests for support from:
 - TVNZ for Freeview NZ
 - Omroep & Technicolor for The Netherlands
- TF1 (France) beginning to investigate and looking to EBU for solution
- Specifications without support for Home Networks and Blu-ray
 - Nordig proprietary mechanism to switch HDCP
 - RTE Ireland – according to Nordig spec
 - HD Forum Italia – HDCP on

Licence Summary

- Tables available free-of-charge under licence through DTG or BBC
- Three licences available:
 - Developers'
 - Receiver Manufacturers'
 - Middleware Vendors'
- Condition of Receiver Manufacturers' Licence to follow D-Book Content Management specification
- Condition of Middleware Vendors' Licence to only sell to other licensees
- Developers Licence strictly limited
- Third party rights for Content Participants to pursue licensees for breach
- BBC could pursue non-licensees for IPR infringement
- DTG Testing to verify manufacturers have appropriate licence in place

Impact on Receivers

- CE Equipment
 - covered by Receiver Manufacturers' and Middleware Vendors' licences
 - DTG checks for valid licence on testing.
 - DTCP and AACS licences only required for advanced functionality
- PC software (e.g. Microsoft, Linux, Mac)
 - covered by Receiver Manufacturers' and Middleware Vendors' licences
 - requires support for HDCP (Offered on 34 of 195 graphics cards on Dabs 24/09/2009)
- Professional Receivers
 - covered by Receiver Manufacturers' and Middleware Vendors' licences
 - no requirement to encrypt HDSDI output
- Portset (text-to-speech)
 - covered by Receiver Manufacturers' and Middleware Vendors' licences
 - Tables allow decompression of strings for text-to-speech
- Open-source decoders
 - unlikely to be licensed as unable to meet confidentiality requirements
- Test & Measurement Equipment
 - covered by Receiver Manufacturers' and Middleware Vendors' licences
 - no requirement to encrypt MPTS Stream recordings

Conclusions

“Keep the honest person honest”

Unlike DVD region coding, majority of viewers unaware

Believe most consumers are willing to trade a bit of convenience for better free content.