



TECHNOLOGY INITIATIVES III

MOTION PICTURE ASSOCIATION
ASIA PACIFIC

PREFACE

The Motion Picture Association (MPA) and its represented studios have historically been at the forefront of technological innovation, beginning with the conversion of still to moving pictures. The pace of change has accelerated greatly over the past ten years - some would say more than during the previous hundred years - and witnessed a migration towards digital, and particularly online communication and delivery. Previously unimagined business models have emerged and been embraced by a new generation of audiences. We and our studios are doing all we can to help make our digital future a present reality. We participate in standards organizations worldwide to improve digital platforms and devices. Indeed, many would argue that Hollywood content drives technological change.

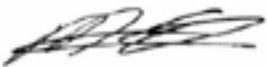
Digital cinema encompasses every aspect of movie making, from production and post-production through to distribution and exhibition. Digitally produced or digitally converted movies can now be delivered to theatres via physical media, fiber optic networks, or satellite.

Digital technology also permits content to be delivered safely and securely into homes according to the legitimate, individual needs of consumers. It enables and facilitates new and innovative usage models. For example, some people might like to watch content only once, or periodically throughout the course of a month, while others may prefer to download it for permanent retention and/or transfer onto a disk. Digital technology facilitates these consumer options, and more. Other business models have emerged including premium video and subscription video-on-demand to engage consumers in new exciting ways.

However, we must at the same time realize this is only possible when the technology that makes it all happen is legally protected. The 1996 WIPO Copyright Treaty and its related corollaries include explicit requirements against the circumvention of both technological protection measures and rights management information, both of which are used by content providers and platform operators to enable these new consumer experiences.

We hope this publication will be helpful to you as we continue to map out the progress of our digital transition.

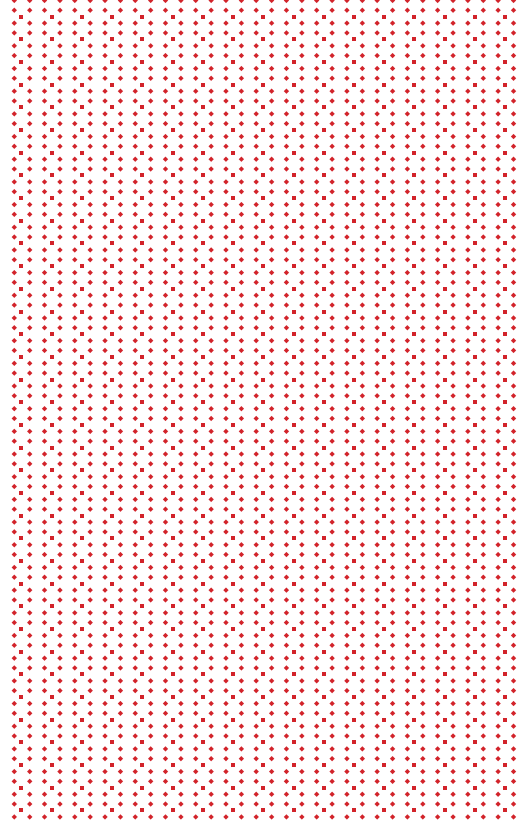
Thank you.



MIKE ELLIS
President and Managing Director, Asia-Pacific
Motion Picture Association

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TECHNOLOGY Q&A

High-value content will drive technological change into our future.

Q1. HOW DOES TECHNOLOGY INCREASE CONSUMER CHOICE?

Merely 50 years ago movies and television programming were limited to a few consumer outlets, namely theatres and early television sets. Today, however, there are many more ways to enjoy high-value Hollywood programming on an array of platforms and devices. Notably, Internet access improvements in countries, coupled with the availability of new devices and delivery methods with software and encryption have facilitated more channels for enjoyment.

Consumers today access content through the Internet, from satellites and broadcasts, in theatres, via packaged media, and over myriad personal devices such as tablets, smartphones, game consoles, PCs and connected TVs. Certainly this is a vast improvement from the early days of broadcast TV. Movie studios are actively pursuing and working with local distributors to provide new services to increase consumer choice.

Q2. WHY CAN'T I FIND MY FAVOURITE TV SHOW IN MY OWN COUNTRY? WHY CAN'T I GET IT ON MY FAVOURITE DEVICE?

While content producers and owners can create strong partnerships, they are often not directly involved in the delivery device and packaging at local levels. Content owners merely license such content to willing broadcasters, distributors or service providers. Content needs to be licensed, channeled, customized and packaged by local broadcasters, distributors and service providers as movie studios do not have the local access to "sell content". Other concerns pertaining to local preferences, licensing and regulatory policies also affect the availability of content.



Local service providers customize their offerings to specific languages, preferred timings, and platforms; they identify devices and standards, and match offerings according to customer preferences. In every jurisdiction, local advertisers work with service providers and broadcasters to sponsor programming. Ad-support or

sponsorship will require information about local consumer behaviour and an understanding of their needs and wants - an asset usually available to a local presence.

Devices such as tablets, game consoles and smartphones are then available to content owners, local distributors and broadcasters to license content locally on such devices.

Q3. WHAT IS THE DIGITAL ENTERTAINMENT CONTENT ECOSYSTEM (DECE)?

The Digital Entertainment Content Ecosystem (DECE) is a consortium formed in 2008 by major Hollywood studios, consumer electronics manufacturers, systems integrators, network hardware vendors, and Digital Rights Management vendors. The purpose of the DECE is to develop technical solutions that help consumers access the content they have purchased on different devices and platforms.

Q4. WHAT IS ULTRAVIOLET™?

UltraViolet™ (or UV for short) is an ecosystem for interoperable electronic content developed by the DECE. UltraViolet™ is a set of specifications and agreements coupled with an integrated rights clearinghouse that allows retailers to sell content that play on all UltraViolet™-compatible players and services. UltraViolet™ helps users to store digital proof-of-purchases under one account to enable playback of content. In the past, there was no one centralized method to register digital rights anywhere when one purchases movies or TV programming. Today, when a consumer buys content, rights information can be saved within UltraViolet™ - a digital cloud, for convenience. Customers purchasing UltraViolet™ content from any merchant can keep track of their "online locker" or "virtual collection" regularly, and play the content on multiple devices marked with the UV logo (e.g. PCs, tablets, smartphones, Blu-ray™ players, cable set-top boxes).

IMPORTANT FEATURES OF ULTRAVIOLET™

Own and collect content permanently	Unlock value in existing collection
Access a large variety of entertainment content	Share content with family members
Excellent value for money	Compelling retailer benefits that support their existence
Purchase from a wide range of retailers	Watch anywhere on multiple devices

ULTRAVIOLET™ FACILITATES THE INTEROPERABILITY OF DRMS

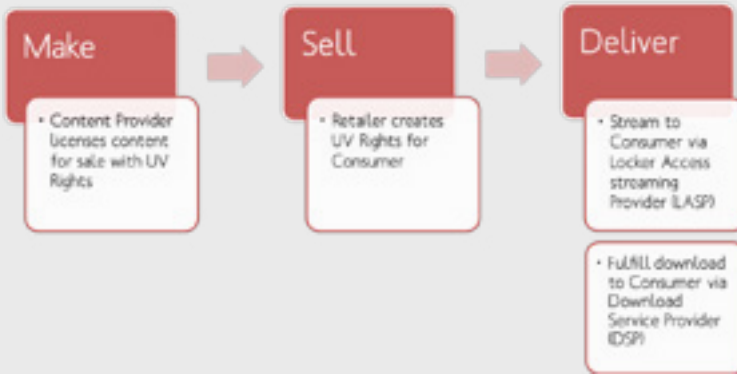
UltraViolet™ uses industry-standard Digital Rights Management (DRM) systems and makes them interoperable. Common encryption means multiple DRMs can be used with a single file, and UltraViolet™ players can use any approved DRM.

UltraViolet™ files (in Common File Format) can be freely shared, copied, backed up and “cloudified”. Playback is granted by checking for a right in the user’s UltraViolet™ locker.



DRMs today work seamlessly and without interference to user experience. DRMs enable content per-device, per-user or per-view and such technologies only give consumers more flexibility in their viewing habits.

RIGHTS INFORMATION EMBEDDED SEAMLESSLY



Q5. WHERE HAS ULTRAVIOLET™ BEEN DEPLOYED?

UltraViolet™ has been deployed significantly and is now a reality for entertainment content consumers in many countries. As of May 2013 UltraViolet™, which has a content range of around 8,700 movie and television titles, and approximately 12 million registered user accounts, has been launched in the United States, Canada, Ireland and the United Kingdom, as well as in Australia and New Zealand. Further UltraViolet™ rollouts are planned in France and Germany for September 2013. Separate launches for UltraViolet™ in the Netherlands, Belgium and Luxembourg are anticipated towards the end of 2013 or Q1 in 2014, although yet to be confirmed. UltraViolet™ deployment has been adopted by more than 74 companies, including most of the major film studios.

Q6. WHO ARE MEMBERS OF THE DIGITAL ENTERTAINMENT CONTENT ECOSYSTEM (DECE)?

The DECE consortium consists of the following:

Film studios

Paramount Pictures, Sony Pictures, 20th Century Fox, Universal Pictures, Warner Bros. and Lionsgate are providing movies for the initial UltraViolet™ promotion program.

Consumer electronics manufacturers

LG, Panasonic, Philips, Samsung, Sony, Toshiba and Vizio are among the home TV companies participating in the UltraViolet™ campaign.



Retailers

UltraViolet™ titles are available from a growing number of merchants including the online sales units of brick-and-mortar retailers. UltraViolet™ retailers include Barnes & Noble (Nook Video), Best Buy, Flixster, ParamountMovies.com, SonyPicturesStore.com, UniversalHiDef.com and Walmart (VUDU).

The management and coordination of technical infrastructure for UltraViolet™ is conducted by Neustar Inc., a provider of network and information services to Internet, retail, media and government customers. UltraViolet™ is a trademark of DCTM Holdings LLC.

Q7. WHAT ARE CLOUD SERVICES?

Audiovisual content, along with other forms of data, is moving fast into the digital cloud. The word “cloud” is essentially a metaphor for the Internet. Cloud services allow consumers to save and access their content on an online database system, instead of on their own personal hard drives or storage devices. Consumers no longer need to carry along external hard disk drives or PCs to watch their favorite movies on the go. Movies and TV programming are now available in the cloud as services that consumers can “tap” from any device anywhere in the world. Movie studios and their partners, such as service providers, are making such solutions available today.



However, as in any other new technology, it is crucial that standards surrounding such technologies are secure and interoperable according to international requirements. The “cloud” will have much less meaning if



it is merely a small cloud covering a specific locale or jurisdiction arising from local standards. Yet cloud services are here to stay and will inevitably function across jurisdictions.

Q8. WHAT ARE THE NEW ONLINE VIDEO BUSINESS MODELS?

Several new business models have been deployed for Internet video delivery today. It is not merely a purchase or rental option as it was some years ago. In the past, the cost of movies and TV programming could not be supported solely by advertisements but many of these boundaries are being tested today.

Interesting new models for content include "freemium" (where a basic digital offering is provided free of charge, but additional features or functionality is chargeable), premium, advertising-supported, pay-per-view, subscription-based and subscription video-on-demand exist for the convenience of viewers. These new options and business models are applied by broadcasters and service providers worldwide. For the consumer, it means differing or structured choices of how they would like to enjoy their favourite movies or TV programs.

Q9. WHAT IS OVER-THE-TOP (OTT)?

Over-the-top (OTT) refers to video content that is delivered without the typical managed network operated by service providers or broadcasters. OTT content is usually delivered through the Internet directly to PCs, devices and TVs. Hollywood content is now prevalent in this field and available via Hulu, Netflix, Crackle and others. OTT opens up a completely new way for operators to generate revenue from video-on-demand, catch-up TV and other interactive applications.

OTT video services focusing on movies and TV programming saw tremendous growth in subscribers and revenues over the last few years. These services are called OTT as they focus on the delivery of content and ride on a broadband provider's network for delivery. OTT video can be linear (e.g. live streaming of broadcasters' channels or new "online only" linear channels) or on-demand (e.g. by providing access to a library of movies and TV programs).

OTT is a growing phenomenon met by differing views in the industry. From the perspective of viewers, OTT is a great platform for increasingly better content. For traditional pay TV providers and broadcasters, this may potentially be a threat but many have now developed distinct content packages to improve their current customers' experiences. From the perspective of the IT industry or telecommunications operators, OTT is a great new addition to the family of products for consumers.

Q10. WHAT IS CONNECTED TELEVISION?

Connected TVs, sometimes referred to as smart TVs or hybrid TVs, are televisions used with Internet connections. These TVs enable users to obtain content through a managed network or directly over the Internet. A connected TV typically has an ethernet cable connection or wireless Internet connection connecting it to the global network. Users may get content from various online streaming sources including Amazon, Hulu, Crackle, Netflix, YouTube and Google Play among others. Connected TVs have a higher focus on online interactive media as well as on-demand streaming media. At the same time, users may also obtain regular local broadcast channels using the television antenna or cable. Connected TVs provide interactive features such as web browsing and social networking in addition to regular television content. Television manufacturers currently sell a wide variety of connected TVs, and users of existing non-connected TVs can add many of the connected features to their current TVs via connected TV-capable Blu-ray™ players and set-top boxes. Connected TV basically brings the ease of Internet into the home's living room TV set. Movie studios are exploring new and improved services on connected TV.

Q11. WHAT IS INTERNET PROTOCOL TELEVISION (IPTV)?

The Internet Protocol Television (IPTV) refers to TV over the Internet on a managed network, requiring a service provider. The IPTV system delivers television programming using the Internet Protocol suite over a secure packet-switched network, instead of being delivered through traditional terrestrial, satellite and cable television formats.



In contrast with video delivered over the open Internet, IPTV is distinguished by its on-going standardization process (e.g., the European Telecommunications Standards Institute (ETSI) works on standardizing functions and interfaces that will allow interoperability between IPTV equipment vendors, network service providers and media content distributors) and secure set-top boxes. Typical security solutions

such as Conditional Access Systems (CAS) or Digital Rights Management are used to protect IPTV content. Examples of IPTV in the Asia-Pacific region would include SingTel's mio TV in Singapore or PCCW's now TV in Hong Kong.

Q12. WHAT IS 3D TELEVISION?



3D television (3D TV) is television that conveys a real-life 3D visual appearance to the viewer by employing techniques such as stereoscopic display, multi-view display or 2D-plus-depth to bring 3D content into the home environment. Most 3D TV sets use an active shutter 3D system (also referred to as alternate frame sequencing) or a polarized 3D system (where polarization glasses are used to restrict light and create the illusion of depth). Some 3D TV sets are autostereoscopic, without the need for specialized glasses. Autostereoscopic 3D TV standards are generally still being tested and standardised by major groups such as the Society of Motion Picture Television Engineers (SMPTE), Digital Video Broadcast (DVB), Consumer Electronics Association (CEA) and others. It is envisaged that such technologies will eventually be standardised and be available for homes in the near future. Movie studios are actively supporting and developing 3D standards for both theatrical and home devices. In the theatrical realm, 3D is a huge development where many new movies are released in 3D format, while older releases are reproduced as 3D versions. Consumers are readily supporting 3D content in the cinema and in the home.

Q13. WHAT IS ULTRA HIGH DEFINITION/4K TELEVISION?

Ultra HD/4K TV is the next generation of High Definition (HD) TV which offers four times higher resolution than the current highest standard HD. A current HD image has a resolution of 1920 x 1080 and is capable of delivering an image comprised of approximately 2 megapixels. However a 4K image has a resolution of 3840 x 2160. This high level of resolution will bring about a revolution in TV viewing, especially for close-view, detailed-oriented content - for example, sports content, and an increase in viewer satisfaction in the many types of TV programming. Studios are currently testing the 4K TV technology and it is envisaged that they will be more active in this space in the coming years in terms of providing customers at home the best resolution possible for live sports content, amongst other potential uses of ultra HD.

Q14. WHAT IS MULTISCREEN VIDEO?

Multiscreen video has emerged as a significant global trend over the past few years. Increasing consumer demand for instantaneous OTT access to video has brought about significant change in the video industry. Consumers want to enjoy streaming video on the largest screen in the house, and yet be able to access the same content on other portable screens in the home. In particular, consumers are keen to obtain their favourite programming on their tablet computers or mobile devices. Because of the availability of such platforms and the different levels of enjoyment in portable screens, consumers now demand such multiple screen services for their subscriptions. Pay TV operators, content programmers and movie studios are all scaling their infrastructures to meet these needs as multiscreen access now becomes the norm.

While multiscreen video delivery is now commonplace, studios are also actively working on “second screen” applications that often accompany TV content. In this interesting new area, real-time information is “pushed” to the viewer while he is watching a separate (often larger) primary screen. There is a real-time relationship between the main screen and second screen. For example, information or data accompanying programming is made available on a tablet, while users are watching their living room TV sets.

The second screen application allows users to message or communicate with other users during a show. Information about actors (or players in a live sports broadcast) can be made available on a second screen device in real-time.



Q15. WHAT IS PREMIUM VIDEO?

Premium video or “Premia” in some instances refers not only to professionally-produced quality content, but rather to a new form of distribution that arrives to consumers months before DVD releases. In various markets, some independent and lower-budgeted films that are not as likely to have major exposure in cinemas are being released online at the same time they are being distributed to movie houses to help spread the word about the films. New technologies with better security solutions have been deployed to deliver premium video. Companies that have developed such solutions have relied on strong encryption and new applications that are compatible with any Blu-ray™ device.

Q16. WHAT IS E-CINEMA & D-CINEMA?

E-cinema and D-cinema are related terms describing the deployment of digital technology to produce, post-produce, distribute or exhibit motion pictures. Both digital systems differ from previous tape and reel standards sometimes referred to as analog. In one definition, D-cinema is deployed throughout the distribution chain right to the projection technology, from source to destination. Subtle differences exist between E-cinema and D-cinema. A particular D-cinema format and standard is managed by Digital Cinema Initiatives (DCI) which is a joint venture of the six major Hollywood studios. DCI published the first version (V1.0) of a system specification for D-cinema in July 2005. The main declared objective of the specification was to define a D-cinema system that would “present a theatrical experience that is better than what one could achieve now with a traditional 35mm...”. Generally, DCI compliant D-cinema standard is 2K and above compared to that of E-cinema standard which is below 2K.

Q17. WHAT IS A VIRTUAL PRIVATE NETWORK (VPN)?

A Virtual Private Network (VPN) connects a host computer across a public network to another computer using a dedicated channel or by using encryption. Technical security is deployed to create a “private” network that is maintained between two points. For example, a practical use of VPN services is enabling secure connections between a mobile user to a corporate network.

Recently some providers have developed new products and services that enable consumers in one country to obtain content hosted in another jurisdiction using VPN services. While VPN services are extremely useful for corporate use and other legitimate services, including but not limited to market segmentation; in this instance the technology may also be used to circumvent geographic or other market-based restrictions in order to obtain access to content that has not, for whatever

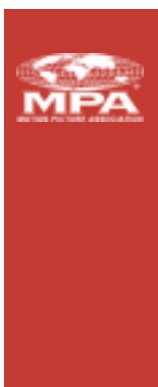


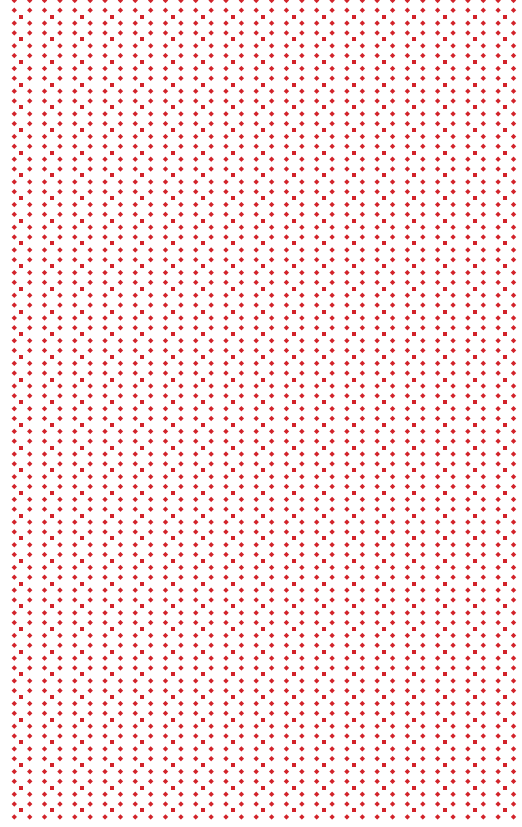
reason, been authorized for distribution in their home countries. Reasons for such unavailability of audiovisual content might extend to inadequate infrastructure, classification (censorship), distribution schedules, or market size that are sometimes implemented through geoblocking restrictions.

Q18. GEOFLOCKING AS A TECHNOLOGICAL PROTECTION MEASURE?

Geoblocking is widely deployed to customise content offerings in different territories. Geoblocking helps legitimate service providers, content providers and broadcasters better serve their local consumers as they provide quality controls, appropriate billing systems and support the proper versioning of content. However, some countries have begun to query the utility of geoblocking as a Technological Protection Measure (TPM), and whether related tools and services should be subject to legal protection and/or subject to appropriate legal exceptions permitting their circumvention. Like a TPM, geoblocking is effectively a form of access control that allows both content providers and platform operators to segment markets, while at the same time recognizing governments' concerns over content classification and regulation.

Audiovisual content providers and consumers, like participants in any other commercial market, are typically bound by the rules and regulations of the jurisdiction in which they transact their business. Geoblocking has thus emerged as yet another technology capable of different uses for different purposes. Importantly, geoblocking also helps local service providers and broadcasters to serve customers and publics effectively with accurate scheduling, versioning, formatting, and languages.





CONTENT RECOGNITION TECHNOLOGY

Fingerprinting and watermarking —
imperceptible and efficient.



Content Recognition Technology (CRT) can be used in various deployment scenarios to combat copyright infringement. CRT also enables the proliferation of legitimate channels that provide consumers with better choices and options to consume content.

Content recognition uses cues such as the title, size of file, sources of data and visual information for content owners to identify the content being transmitted over the Internet or digital platforms. Cues such as textual metadata, hashes, fingerprints and watermarks are typical automated ways to identify content online. Typically, content recognition is then augmented with a policy-based response model where content owners, Internet Service Providers (ISPs) or Online Service Providers (OSPs) can choose their method of response to online copyright infringement.

FINGERPRINTING AND WATERMARKING

Digital fingerprinting and watermarking are particularly relevant technical methods for content recognition as they can robustly identify content even if characteristics have changed (for example, if the content has been transformed into a lower-resolution file in a different format). These methodologies can be used to identify digital information of TV or movie content being transmitted over broadcast or the Internet.

Watermarking has existed for thousands of years in cases where humans needed to identify authentic works on paper. With modern digital watermarking, a signal is embedded directly into the content; it is imperceptible to humans but detectable by machines. Common applications of watermarking exist in the Blu-ray™ standard and in most movie content shown in theaters.



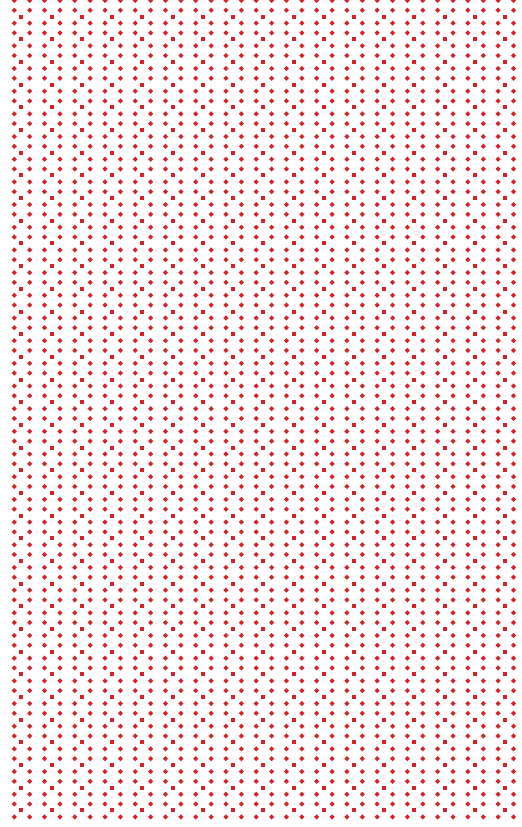
Fingerprinting, on the other hand, often involves a methodology that extracts the audiovisual data so that information can be referenced. Fingerprinting may be described as using a mathematical imprint or “understanding” of the audiovisual data. This information is then compared with known databases to confirm if the copy is legitimate.

Content fingerprinting technologies, in short, represent a rapidly advancing technology with many applications. It is an extremely exciting field with many new applications and potential deployment in the Asia-Pacific region. It is currently deployed most rapidly for online content.

By these methods, content owners can efficiently and accurately identify their content.

The impact of fingerprinting and watermarking technology is exciting because it helps the monetization of content over various platforms including the Internet. It would also curb users from illegally uploading copyrighted material to websites. ISPs and OSPs can make an effort to prevent illegal content from being uploaded and downloaded, and many leading service providers have deployed such services on their own. Where applied effectively, content recognition may help to decrease the instances of infringement and prevent inexperienced users from breaking the law.

Content recognition technologies are now widely deployed as commerce-enabling tools. Only two forms are discussed briefly above. These technologies can be used in various deployment scenarios to combat copyright infringement and enable the proliferation of legitimate channels that provide consumers with better choices and options to consume content.



UBIQUITOUS DEPLOYMENT OF TECHNOLOGICAL PROTECTION MEASURES (TPMS)

TPMs allow the seamless
functioning of digital media.

TPMS ARE PART OF THE LAW WHICH RECOGNIZES AND PROTECTS DRM

With the arrival of the digital age, it is possible for consumers to make numerous copies of copyrighted materials, without a discernable loss of quality, unlike analog.

Furthermore, digital copies can last forever in perfect state as opposed to analog or magnetic "tape" copies. This leads to the possibility that copyright protection could be overridden by uncontrolled copying, especially since such illegal actions are often difficult to trace.

Technological Protection Measures, or TPMs, are defined as being any technology, component or device designed to prevent or restrict acts with respect to works or other subject matter that are not authorized by the rights holder of any copyright-related right. TPMs are part of the law which recognizes and protects DRM.

In response, technology enabling copyright owners to control access to and the duplication of copyrighted works, such as encryption software and copy-controlling mechanisms, were developed and their importance have become more apparent in the digital age.

There is, however, the problem that protection measures, just like any technology, can be circumvented. In order to prevent this, Art. 11 of the 1996 WIPO Copyright Treaty was enacted, to require the contracting states to provide adequate and effective legal remedies against the circumvention of effective technological measures.

WHERE AND HOW TPMS ARE IMPLEMENTED


TPMs may be implemented for broadcast content, packaged media content and within electronic devices. TPMs may be software-driven or hardware-based. Taken together, the TPMs implemented provide fairly comprehensive protection to the copyright owner as a piece of copyrighted work, for example, a movie, is often distributed and may be reproduced at any one of the three junctures cited above.

Broadcast

TPMs may be implemented at the source of broadcast, to restrict the reproduction or further transmission of copyrighted works. For example, a cable-TV operator may scramble the signals sent out to its users, to prevent the unauthorized reception of its signals by other users who are not subscribers to its services. This is similar to a pay TV system.

Packaged Media

In respect of the different storage media, TPMs protect the scrambling of the content on the



media such that the byte-for-byte copying of the copyrighted material is not possible. When movies and TV are distributed via packaged media such as Blu-ray™ discs, content may be protected by both the encryption and a license document.

For Blu-ray™, the relevant license document and protective technology are embodied in the Advanced Access Content System (AACS) agreement. AACS uses cryptography to control the use and access to digital media by encrypting content stored on the storage media.

Connectors

High-bandwidth Digital Content Protection (HDCP) restricts connections to video displays while Digital Transmission Content Protection (DTCP) restricts sending over USB connections. Today there are multiple connection types that are used in addition to the above.

TPMs may also be implemented as software or hardware protection for Internet-based distribution of content.

Interoperability

The importance of interoperability between different devices and between platforms of delivery (such as IPTV, broadcast and satellite), a problem that has plagued consumers for years, has since been resolved by new technical platforms and/or cloud systems such as UltraViolet™.



LEGALIZING 'FORMAT SHIFTING'

Today, we find many consumer conveniences available in the market that allow consumers to copy content onto their portable devices such as tablets and smartphones. These commercially available conveniences provide "format shifting" capability for the content. Content owners have been actively pursuing new

technological and legal means to channel content to various platforms.

There are a number of marketplace initiatives across the world that aim to provide consumers with access to content across multiple devices and formats. For example, platforms such as iTunes and Google Play facilitate such consumer conveniences.

These initiatives use multiple approaches and business models (such as copies bundled with product or service purchase and paid copies) to provide consumers with access to content in different formats. In many jurisdictions, when one buys a physical copy, access is granted to a digital version online as well.



Deployed commercial approaches include, but are not limited to:

Digital copies from DVDs/BDs

- Second Session digital versions of titles present on the DVD/BD, usually protected using DRMs

Managed copies from AACs-protected BDs

- Authorized managed copy mechanism that allows consumers to acquire digital copies of high-definition physical media

Digital download stores that support multiple formats

- Consumers rent, subscribe or purchase content that can be copied onto multiple devices in multiple formats

Download to burn

- Technologies that allow consumers or professional retailers to download digital copies and then burn them onto physical media



Downloaded digital copies with physical DVDs/BDs

- Consumers buy the physical DVD/BD, and receive a coupon to download a free digital copy from an affiliated service

Pay TV broadcast and digital downloads

- Consumers have a pay TV subscription, and get digital copies of the content on their PCs and other devices

Streaming Internet content

- Direct streaming to multiple devices from the Internet

Cloud services

- Cloud services such as UltraViolet™ and others can bring multiple access and screens to consumers

DRM supported copying

- Modern DRM systems do allow copying to take place between a primary device and a secondary device, or multiple devices



There are numerous examples to cite in terms of real-world examples of "format shifting". To "legalize format shifting" would mean curbing on new services and possibilities. More importantly, it would render the worldwide content-protection system unworkable if laws allowed the "breaking" of TPMs.

MAJOR ONLINE MOVIE AND TV SERVICES OFFERING LICENSED FILM AND TV SHOWS

The list below features some of the online services in the Asia-Pacific region which offer licensed full-length films and TV shows to consumers, including multi-country services such as iTunes.

Australia	ABC iView	China	Bbn	Hong Kong	iTunes (Apple)
Australia	Crackle	China	BesTV	Hong Kong	Netvigator.com
Australia	Fetch TV	China	CCTV	Hong Kong	Now.com
Australia	Foxtel Go	China	CCTV Movie Channel	Hong Kong	TVB
Australia	Google Play	China	iQiyi	India	BigFlix
Australia	iTunes (Apple)	China	Joy	India	BoxTV
Australia	Madman	China	Ku6	India	Eros
Australia	Nine MSN Video	China	LeTV	India	Google Play
Australia	Optus TV	China	PPS	India	iTunes (Apple)
Australia	PlayStation (Sony)	China	PPTV	India	Rajshri
Australia	Quickflix	China	QQ	India	Yahoo! India
Australia	SBS	China	Sohu	India	YouTube
Australia	Seven Network - Plus 7 TV	China	Tudou	Indonesia	iTunes (Apple)
Australia	smh.tv	China	TV189	Japan	acTVila
Australia	Sony Entertainment Network	China	Voole	Japan	Animate.tv
Australia	Telstra	China	Wasu	Japan	Anime One
Australia	Ten Network	China	You On Demand	Japan	au Lismo! Video
Australia	TiVo (CASPA on Demand)	China	Youku Tudou	Japan	Bandai Channel
Australia	TVS	Hong Kong	Anyplex	Japan	DMM
Australia	Xbox Video	Hong Kong	City Telecom (HK) Ltd	Japan	Fuji TV On Demand
Australia	YouTube	Hong Kong	Deltamac	Japan	goo Broadband Navi
Cambodia	iTunes (Apple)	Hong Kong	FOX Movies Play	Japan	Google Play
China	56.com	Hong Kong	HBO	Japan	GyaO

Japan	GyaOI Store	Japan	Xbox Video	South Korea	CGV
Japan	Hikari TV	Japan	YouTube	South Korea	Cine21
Japan	Hollywood Channel Inc.	Malaysia	iTunes (Apple)	South Korea	Cinexpox
Japan	Hulu	Malaysia	Media Prima	South Korea	Cinero
Japan	iTunes (Apple)	New Zealand	Four On Demand	South Korea	Conpia
Japan	KBS OnDemand	New Zealand	iSky	South Korea	Daum Communications
Japan	Movie Square	New Zealand	iTunes (Apple)	South Korea	GOM TV
Japan	NHK on Demand	New Zealand	Maori Television	South Korea	Google Play
Japan	Nico Nico Douga	New Zealand	Quickflix	South Korea	IMBC
Japan	Nintendo Wii	New Zealand	Sky TV on Demand	South Korea	M Channel
Japan	Playstation (Sony)	New Zealand	TiVo (CASPA on Demand)	South Korea	Max Movie
Japan	Rakuten Download	New Zealand	TV3 On Demand	South Korea	Naver
Japan	ShowTime	New Zealand	TVNZ OnDemand	South Korea	Pandora.TV
Japan	SKY PerfecTV! On Demand	New Zealand	Xbox Video	South Korea	Playy TV
Japan	Sony Entertainment Network	Philippines	iTunes (Apple)	Taiwan	CatchPlay
Japan	Toei Anime BB Premium	Singapore	iTunes (Apple)	Taiwan	Ch5
Japan	Tokyo Broadcast Systems	Singapore	MediaCorp Pte Ltd	Taiwan	ciaomobile
Japan	Tsutaya TV	Singapore	Mio TV	Taiwan	ELTA.TV
Japan	tv-asahi douga	Singapore	PictureBox	Taiwan	Fetnet.net
Japan	Videopass	Singapore	Singapore Telecom	Taiwan	Hichannel
Japan	Videx	South Korea	Anymovie	Taiwan	iTunes (Apple)
Japan	Warner on Demand	South Korea	Buxmovie	Taiwan	NextTV

Taiwan	Realma	Thailand	3BB	Thailand	True Vision
Taiwan	TOP TV	Thailand	iTunes (Apple)	Vietnam	iTunes (Apple)
Taiwan	Yam TV	Thailand	Mthai		

(As of June 2013)

RECENT KEY DEVELOPMENTS IN THE ASIA PACIFIC REGION

August 2011	Yahoo India launched Movieplex, an ad-supported online video-on-demand service for Bollywood films.
September 2011	Hulu launched its online streaming service in Japan, its first international market.
November 2011	Australian online DVD rental company Quickflix launched an online streaming movie subscription service.
November 2011	Nico Nico Douga, a popular Japanese online video (UGC) site, launched a new service offering Warner Bros. movie and TV shows for online subscription, rental and download.
June 2012	Apple launched iTunes stores in Hong Kong, Singapore, Taiwan, Brunei, Cambodia, Laos, Macau, Malaysia, Philippines, Sri Lanka, Thailand, and Vietnam. Movies, many in HD, are available from major studios including 20th Century Fox, Paramount Pictures, Sony Pictures Home Entertainment, The Walt Disney Studios and Warner Bros. Pictures.
August 2012	YOU On Demand, the leading pay-per-view (PPV) and video-on-demand (VOD) platform in China, signed a deal with Paramount to offer the studio's movies. The service reportedly also has agreements with Warner Bros., Disney, Lionsgate, Miramax and Magnolia.
August 2012	Chinese online video giant Youku reported that it has completed its acquisition of rival Tudou Holdings. The combined entity, known as 'Youku Tudou', is estimated to have a more than 30 percent share of the Chinese online video market. Film and TV content are available from Disney, NBCU, Paramount, Warner Bros., DreamWorks, Fox and other international content providers.
February 2013	HBO Asia announced the launch of its streaming service, HBO Go, for 'now TV' customers in Hong Kong - the first in Asia to offer this service.
March 2013	Google Play added movies for rent and purchase on the website or via an app on Android devices for customers in India.
May 2013	China's largest Internet search-engine operator Baidu acquired online video provider PPS Net TV and merged it with Baidu's existing video platform, iQiyi.

ADVANCED ACCESS CONTENT SYSTEM (AACS)

The Advanced Access Content System (AACS) is the accompanying license and digital rights management which will allow access to and copying of next generation Blu-ray™ systems. AACS includes the following key attributes that makes it a reliable system:

- AES-128 content scrambling
- Media Key Block based revocation
- Software renewability
- Enhanced authentication for PC-based implementations
- Support for managed copying and download-to-burn usage models

BLU-RAY™

A next-generation DVD standard, principally developed by Sony, that supports high definition (HD) video and the larger storage capacity that HD material requires. Blu-ray™ uses a 405-nanometer wavelength blue-violet laser instead of the traditional DVD 650-nanometer red laser. The smaller laser wavelength allows the disc to use smaller pits and tighter tracks. It also uses a thinner cover layer (0.1 mm) than a standard DVD. This moves the data closer to the reading lens. All of these factors combine to fit more data on the same size disc. Blu-ray™ supports 25 GB in a single-layer configuration or 50 GB in a double-layer. Four-layer and eight-layer disc in development can store 100 GB and 200 GB, respectively. This capacity is sufficient for two to four hours of HDTV content on single- and double-layer discs. Blu-ray™ also supports MPEG-2, MPEG-4, AVC, and VC-1 format video. Blu-ray™ is a trademark of the Blu-ray Disc Association.

DIGITAL CINEMA INITIATIVES (DCI)

Digital Cinema Initiatives (DCI) is a joint venture between major Hollywood studios to establish specifications for an open architecture for digital cinema to perform at a high level of reliability and quality.

DIGITAL ENTERTAINMENT CONTENT ECOSYSTEM (DECE)

The Digital Entertainment Content Ecosystem (DECE) is a consortium formed in 2008 by major Hollywood studios, consumer electronics manufacturers, systems integrators, network hardware vendors, and Digital Rights Management vendors to develop technical solutions that help consumers access the content they purchased on different devices and platforms.

DIGITAL RIGHTS MANAGEMENT (DRM)

A system that protects content so that only authorized users may access or view it; a technology that enables the secure distribution, promotion, and sale of digital content, especially on the Internet. A DRM usually encrypts a file to prevent unauthorized use and enforces usage parameters such as the period of time the file is viewable and whether or not it may be copied or streamed to another device.

DIGITAL TELEVISION

Television broadcasts and supporting equipment (including television receivers) that use a digital signal rather than the traditional analog form common to NTSC, PAL, and SECAM. Digital television provides better image and sound fidelity than analog television and generally has higher image resolution and multi-channel stereo sound.

DIGITAL VERSATILE DISC (DVD)

A 4¾" (12 cm) high-capacity optical disc standard, introduced in April 1997 as a video delivery format to replace the ubiquitous VHS tape. DVDs commonly carry digital video compressed with the MPEG-2 codec. Even with the occasional digital compression artifact taken into account, a DVD provides a better motion picture recording format than its predecessors: a DVD can hold far more material than a CD or VCD (from 4.7 GB to 17 GB); DVD movies are recorded with more lines of image resolution (480) than videodiscs (~425) or VHS tapes (~250); and DVD audio (sampled at 96 kHz with 24-bits of data per sample) is superior to CD audio (44.1 kHz/16-bits).

- DVD-5: A single-sided, single-layer (SS/SL) DVD capable of holding 4.7 GB. The most common type of DVD.
- DVD-9: A single-sided, dual-layer (SS/DL) DVD capable of holding 8.5 GB.
- DVD-10: A double-sided, single-layer (DS/SL) DVD capable of holding 8.4 GB. The second most common type of DVD. (One must generally flip the DVD over to read the second side.)
- DVD-18: A double-sided, dual-layer (DS/DL) DVD capable of holding 17 GB.

DIGITAL VIDEO BROADCAST (DVB)

Digital Video Broadcast(ing), a European standard for digital television technology and the body that regulates the standard. The DVB website is www.dvb.org.

HIGH-DEFINITION TELEVISION (HDTV)

The high definition portion of the DTV (digital television) standard, including 1080i and 720p formats with a 16:9 aspect ratio and multi-channel CD-quality sound. The lower DTV resolutions (480i and 480p) are part of SDTV (standard definition television). Compared to standard NTSC television, the HDTV image has twice the luminance definition - both vertically and horizontally - and is twenty-five percent wider. All told, an HDTV picture contains five times more information than does the standard television picture.

INTERNET PROTOCOL TV (IPTV)

The Internet Protocol Television (IPTV) system delivers television programming using the Internet Protocol suite over a secure packet-switched network, instead of being delivered through traditional terrestrial, satellite and cable television formats.

OVER-THE-TOP (OTT)

Over-the-top refers to video content that is delivered through the open Internet without the typical managed network operated by service providers or broadcasters.

SET-TOP BOX

A television receiver (often with an integrated decoder/descrambler and more recently with an integrated digital-to-analog converter) provided as a self-contained unit. Cable and satellite television systems often use set-top boxes to convert the provided signal into a form that can be viewed on the user's television.

UNAUTHORIZED REDISTRIBUTION

"Unauthorized Redistribution" is re-broadcast or retransmission of content without permission of the content owner or broadcaster. Traditionally, this has been through large or moderate scale unauthorized transmission sites that can be addressed through business-to-business negotiations or manageable law enforcement efforts. With the advent of advanced digital technologies, high-speed Internet access and digital broadcast TV, an increasing number of consumers have the ability to become a broadcaster with the touch of a button.

VIDEO-ON-DEMAND (VOD)

Video-on-demand (VOD) allows consumers to view video content on request through televisions, computers or devices such as smartphones and tablets. VOD can be transaction- or subscription-based. In the former, a consumer pays for each individual VOD program, whereas in the latter, the consumer pays a set amount (often monthly) for a specific amount of content.



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