



Global Business Dialogue on Electronic Commerce

Intellectual Property Rights Technological Protection Measures

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INTRODUCTION

This year's GBDe IPR Working Group has agreed to establish some high level general principles applicable to technological measures used to identify, protect and manage copyright works in the digital environment.⁸ New business models and technological innovations are rapidly transforming the way in which content providers create and distribute their works and offer consumers new and exciting means of receiving and enjoying these works. In addition, particular legal, business and technical challenges are presented by the increasing use of peer-to-peer technologies, which - because of their complex

⁸ For the purposes of this paper, the term "copyright works" shall also refer to subject matter protected in many countries under a legal regime of so-called "neighboring" or "related" rights.

nature - are dealt with in an Annex to this paper under the auspices of digital rights management.

The GBDe is guided by its knowledge of the value of lawful use of protected works in stimulating the creative process and supports a balanced approach that protects both the rights of content providers and the interests of various other parties. This approach must reflect the fact that technological advances pose a challenge to those who create and/or distribute their works digitally and who are seeking to protect their works from unlawful reproduction and distribution. Widespread digital piracy of copyright works threatens to undermine the development of legitimate online content distribution.

The GBDe embraces the technological innovations and commercial applications that are

increasingly being made available in the marketplace. Industry is actively engaged in research and development that will continue to transform the business and technological landscape in the future. These new models and technologies give both consumers and content producers new tools with which to make informed choices about the content they consume and produce, as well as where, how, and on what devices they consume and distribute that content.

The GBDe strongly supports the development of technological measures that enable creators and rightsholders to employ new business models and empower consumers to legally access and use the full range of diverse content available in the digital environment. The GBDe recognizes that technological measures are designed to perform different functions and respond to different approaches to markets and content protection. Some of these may help rightsholders identify their works in a digital environment, others may help protect works and enable them to be more easily distributed to authorized users.

Some approaches may involve “proprietary” systems or architectures, or systems that reflect an approach being pursued by a limited number of parties in voluntary private negotiations. These systems would typically be subject to commercial agreement between private parties. Other technological measures may involve “open” systems and may be subject to broad industry agreement or standardization. All of these types of measures will potentially prove useful in facilitating the legal access and use of content.

It is the desire of all members of the GBDe that the Internet supports a secure environment in which legitimate content distribution via electronic commerce can flourish. Artists, musicians, writers, filmmakers, animators, game and software developers and other rightsholders invest substantial time and resources in the creation of their art and products and in mastering their craft. The creation and production of copyright works also requires a substantial financial investment, which is

typically recouped through the licensing of uses of the work or the sale of copies. Any profits can then be re-invested into the creation of new works.

In addition, network operators have a substantial investment in the infrastructure and services that support the Internet, and an interest in ensuring that the integrity of their networks is not compromised. Stakeholders can ensure a stable and secure environment in which online content distribution can flourish by reaching industry-wide consensus on open and globally harmonized technological content protection standards. A standards setting process that reflects the consensus of all relevant stakeholders is an effective means of meeting all of their respective needs.

In order to ensure that access to and use of copyright works is legitimate and fully respects the rights of content providers, it is necessary to be able to identify copyright works and manage the usage and exploitation of such works. The GBDe believes that widely agreed industry-developed standard technological measures and an appropriate legal framework that achieves full implementation of the WIPO Copyright and Performances and Phonograms Treaties of 1996 (“WIPO Treaties”) are important elements for the effective protection of intellectual property rights in the digital environment and the development of an orderly and legitimate electronic marketplace.

The various types of technological measures permit content owners to offer consumers works in higher quality formats (such as DVD and enhanced definition TV) and over a wider array of distribution channels and price points. Cross-sectoral multi-industry efforts to develop and deploy standard technological measures will ensure that they fulfill their purposes without imposing unreasonable financial or operational burdens on equipment manufacturers, service providers, or the efficient operation of communications networks.

Technology, even when robust or reliable, will be subject to attack from hackers and pirates. For

this reason, technology alone is not sufficient to protect copyright works from unauthorized reproduction and distribution. Legal safeguards, such as those required by the WIPO Treaties, must, therefore, also be in place to support technological measures and prohibit unlawful circumvention. In recognition of this fact, requirements to prohibit the circumvention of these technologies are a central feature of the WIPO Treaties.

In 1999, the GBDe concluded that Governments should promptly and faithfully ratify the WIPO Treaties and implement appropriate legal frameworks for effective technological protection measures. It was further agreed that such legislation should also prohibit circumvention related activities by regulating both conduct and devices, while providing appropriate exceptions, such as those set forth in the U.S. Digital Millennium Copyright Act of 1998 (“DMCA”), that would maintain the overall balance between rightsholders, service providers and users.⁹

The U.S. implemented the WIPO Treaties in the DMCA, Japan implemented the WIPO Treaties in the 1999 Copyright Law of Japan (“JCL”) and other laws, and the E.U. will shortly implement the WIPO Treaties through the various national member state laws adopted pursuant to the EU Copyright Directive (“EUCD”). The DMCA, the Japanese laws and the EUCD adopt a regime that prohibits both acts of circumvention and manufacturing, importing, offering and otherwise distributing circumvention devices to the public. Such devices and their components are prohibited only to the extent that they are designed, produced, marketed or distributed for the prohibited purpose of enabling the circumvention of technological protection measures or have only a limited commercially significant purpose or use other than to circumvent. The DMCA, the Japanese laws and

⁹ For further details, please refer to the GBDe IPR policy paper of 1999, a summary of which can be accessed on the GBDe website at <http://www.gbde.org/ipr>

the EUCD offer a useful model for other countries to consider when determining the extent to which legislative changes are needed to implement the anti-circumvention provisions of the WIPO Treaties.

There are multiple business models being pursued to offer digital content, and several private cross-sectoral industry-wide negotiations as well as open standard setting processes underway around the world that relate to technological measures. These include DVB, TV Anytime, CSS (DVDCCA), DTCP (5C), CPRM (4C), HDCP, MPEG, SMPTE, ISAN, cIDF and SDMI, to name but a few. Because technological measures often require a degree of implementation by content owners, service providers and equipment manufacturers to function effectively, cross-sectoral multi-industry recognition and licensing arrangements are often essential to facilitate enforcement. It is not the intention of the GBDe to introduce yet another set of specific technological measures, nor is it the intention of the GBDe to endorse any particular initiative. Rather, the GBDe wishes to establish certain high level general principles that we believe ought to broadly apply to all such initiatives. These general principles are set forth below.

GENERAL PRINCIPLES

A. Scope of Application

While recognizing that no one technological measure can respond to the requirements of all stakeholders, these general principles are intended to promote the development of standard technological measures which can be used to identify, protect and manage all forms of content in various environments and physical locations irrespective of the media on which it is stored (e.g., videocassette, DVD, PVRs, memory cards, etc), the delivery system by which it is transmitted, accessed or made available (e.g., TV, Internet, etc.) or the equipment or device by which it is received, displayed, recorded or transferred (e.g., TV sets, PCs, handheld devices, etc.).

B. Self-Regulation and Standardization

Technological measures may be adopted voluntarily through the use of private commercial agreements, and may also be the subject of industry-led and/or Government-facilitated standardization processes. Standardized technological measures should be developed and mutually agreed upon by a broad multi-industry group of stakeholders in an open, fair and voluntary standards setting process. The GBDe supports Governments facilitating, in a reasonably expeditious manner, the development of open and globally harmonized technological content protection standards.

C. Certain Exceptions

National copyright laws often provide for certain exceptions to the rights of rightsholders. According to the Berne Convention, the TRIPS Agreement and the WIPO Treaties, these exceptions may only be provided for “in certain special cases that do not conflict with the normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the author” or related rightsholder.

Some have expressed concern that the decisions of rightsholders about whether and how to use technological measures may compromise the ability of consumers and other groups of beneficiaries to benefit from copyright exceptions. Others believe that the use of technological measures will benefit consumers by maximizing choice, facilitating greater availability of content in new formats and distribution channels.

Technological measures can be designed and used to accommodate certain exceptions in a rational and balanced way through the creation of special consumption rules for particular consumers or groups of beneficiaries. Content owners have an interest in making their works available, using various business models, to the widest audience possible. Content that remains locked away does not generate value for its creator or for anyone else in the value chain.

The GBDe believes that technological measures will facilitate rightsholders’ ability to identify and manage the dissemination of their works in existing and new distribution channels, and will help prevent unlawful reproduction, distribution, (re)publication and (re)transmission. Such measures will also lead to the growth of business models in which rightsholders can seek different levels of compensation directly from consumers for different uses of their works and opportunities to legally access and use those works can be enhanced. Other stakeholders involved in the distribution of digital content, including service and infrastructure providers, can also benefit from such measures.

Technological measures will enhance the tools available to rightsholders to manage their rights in accordance with public interests and will play a critical role in promoting more convenient and wider distribution and communication of works to consumers, while taking account of the concerns of network operators and other stakeholders.

Any exceptions or limitations to anti-circumvention obligations must be focused narrowly enough to preserve the adequacy and effectiveness of the anti-circumvention prohibitions. Exceptions to anti-circumvention obligations should not be so broad as to undermine the basic prohibition, or to permit the sale or distribution of circumventing devices to the public.

The GBDe notes that outright exceptions to anti-circumvention provisions are not the only way to maintain the policies behind copyright exceptions and limitations. Other techniques are available and have been used in different jurisdictions, including the establishment of a mechanism for ongoing government supervision to ensure that technological measures are not used in such a way that they adversely affect lawful uses of copyright works. In Europe, for instance, the approach has been to give rightsholders the opportunity to honor exceptions by providing reasonable abilities for users to benefit from those exceptions. In the event that

they do not do so, national legislators will be able to intervene.

D. Copyright Levies

Copyright levies are imposed by some national Governments in order to attempt to compensate rightsholders for legal private copies of their works made by consumers. The development and deployment of technological measures can increasingly enable rightsholders to establish direct relationships with their customers and directly track and manage the legal use and copying of their copyright works.

The GBDe believes that one of the clear benefits of technological protection measures is that, when effectively implemented, they can eliminate the need for, and the legitimacy of, copyright levies in those countries where such levies are imposed. The GBDe supports the rapid development and deployment of effective technological measures in order to avoid the proliferation of new copyright levies that could have a potentially negative impact on economic growth, business investments and global competitiveness and potentially undermine remunerative business models.

E. Accommodation and Non-Interference

In 1999, the GBDe Liability Working Group concluded that, “any framework should refrain from imposing on Internet service providers a general requirement to monitor the information they transmit or store, and should refrain from imposing unreasonable burdens on the various stakeholders.”¹⁰ This is consistent with the existing legal framework in the U.S. and the E.U.

In 2000, therefore, the GBDe recommended the voluntary adoption of IPR specific notice and takedown procedures for use in relation to

¹⁰ For further details on the subject of liability, see the GBDe 1999 Policy Paper of the Liability Working Group, a copy of which is available on the GBDe website at <http://www.gbde.org/ipr>.

allegedly infringing materials that reside on a service provider’s system or network.¹¹

Relief from a general duty to monitor, however, should not be construed as a limitation on rightsholders’ ability to carry out their own monitoring activities or identification of infringing works through means which may include the use of standard technological measures or other measures which can be accommodated by Internet service providers.

Where standard technological measures are developed pursuant to a broad cross-sectoral multi-industry consensus, including content owners and service providers, and do not impose substantial costs on service providers or substantial burdens on their systems and networks, service providers should accommodate and not interfere with such technological measures. This is consistent with the existing legal framework in the U.S. DMCA.

F. Copyright Management Technologies

Some types of copy control technologies, such as watermarks, effectively embed within the content itself copy control and content management information that travels with the content from end-to-end (from initial distribution to end-user consumption). These technologies are designed to assist in ensuring that content is persistently protected at all points along the distribution chain throughout its commercial lifecycle. These types of technologies can be effective in preventing unlawful access and copying if appropriately responded to by playback and recording devices, and if their integrity is not compromised and they are not rendered ineffective before the content reaches the end-user.

¹¹ For further details on the subject of notice and takedown, see the GBDe 2000 IPR Specific Model Notice and Takedown Procedures, a copy of which is available on the GBDe website at <http://www.gbde.org/ipr>

Watermark technologies, supplemented where necessary with other types of copy management encryption technology, can help to ensure that content is persistently protected. These can include, for example, digital rights management systems, which are designed to enable multiple usage models including secure peer-to-peer technology, facilitate payments to rightsholders and provide protection against copyright infringements. These peer-to-peer technologies are discussed in further detail in the Annex attached.

The GBDe believes that cross-sectoral industry-wide discussion, development and negotiation should be encouraged in an effort to reach agreement on standard consensus technologies. The GBDe supports Governments facilitating, in a reasonably expeditious manner, the development of open and globally harmonized technological content protection standards.

G. Interoperability

Standard technological measures adopted and established to identify, protect and manage copyright works should, wherever possible, allow for interoperability with other technological measures and function over a wide range of equipment and distribution channels. Where possible, standard technological measures should be capable of interacting with each other in a manner that preserves the integrity of the copy protection and management information that travels with the content and the integrity and efficiency of network operations.

H. Extensibility and Flexibility

Standard technological measures adopted and established to identify, protect and manage copyright works should be sufficiently extensible (meaning not static and capable of extension) and flexible to ensure that new technological developments can be accommodated and business models can evolve.

I. Availability and Access

Once standard technological measures and specifications are agreed upon, they need to be developed into a solution that can then be implemented and made commercially available. Standard technological measures which are offered by the developers or owners should be widely available on fair, reasonable and non-discriminatory terms for implementation by all relevant stakeholders.

J. Robustness and Recoverability

Technological measures and distribution methods will need to evolve in order to provide effective protection of copyright works on an ongoing basis. Technology, even when robust or reliable, will be subject to attack from hackers and pirates. Technical specifications should, where possible, anticipate this contingency in order to maintain the effectiveness and robustness of the measures used. Technological measures should be designed to be as tamper resistant as possible and, where possible, appropriate procedures should be put into place to recover swiftly and effectively from an unlawful hack.

At the same time, technological measures need to be implemented in ways that do not impose unreasonable costs or burdens on equipment manufacturers and service providers. Standard technological measures should provide effective protection of copyright without unnecessarily affecting the overall quality of the user experience, i.e. by interfering with the image or sound or by otherwise materially degrading the quality of the content and/or service, or the performance of the device.

CONCLUSION

The development and implementation of effective standard technological measures is an ongoing process that will require the cooperation of all relevant stakeholders. New business models and effective technological measures are

useful tools to continue to expand electronic commerce over the Internet. An increased ability to protect intellectual property rights and to manage the distribution of copyright works over the Internet and other global methods of distribution, will spur rightsholders to make more and higher quality copyright works available in digital environments. As a consequence, consumers will enjoy more choice and variety, and will have access to more legitimate works of the highest quality. Effective technological measures and legal safeguards to protect such measures from unlawful circumvention are an important means by which intellectual property can be identified, protected and delivered securely.

ANNEX

Digital Rights Management & Peer-to-Peer Technology

A Proactive Business Approach

This year's GBDe IPR Working Group seeks to establish high level general principles applicable to technological measures used to identify and protect copyright works in the digital environment. In this context, an analysis of the peer-to-peer (P2P) file-transmission phenomenon was considered to be appropriate, focusing on the significance of digital rights management in this environment.

Robust protection of intellectual property in the digital environment is a necessary precondition for the commercial use of P2P technology as an effective means of distributing copyright works. Against this background, the present paper explores both the economic potential of P2P technology for the content industry and the necessity to protect intellectual property rights through digital rights management systems. In this paper, the notion of digital rights management is used in a non-technical manner, covering all systems that enable secure P2P file-transmission, ensure payments to rightsholders and provide protection against copyright infringements.

A. P2P Technology – definition and models

During the last decade, the Internet has developed into the most important global communications network. Although built on a basic set of communications standards (TCP/IP), the architecture of the Internet has never been static. New standards or Internet protocols (e.g. HTTP, FTP, SMTP) have evolved over time that have added new functionalities to the basic set.

P2P-technology adds a further dimension to existing Internet communications standards. P2P file-transmission means that information is exchanged between computers that are communicating with each other and are playing

similar roles. They are considered as “peers” as opposed to the server/client relationship of computers used in the environment of Web browsing or email applications. Computers at home and on the desktop are directly connected to each other, forming groups or communities and communicating in order to function as user-created search engines or file systems. P2P therefore has the potential to profoundly change the way in which digital information and goods are exchanged and distributed.

There are two main models to employ P2P technology: a centralised and a decentralised model.

The Centralized Model

Within the centralized model of P2P file-transmission (used by companies such as Napster, Scour and Flycode), a central system of indices and search tools manages the exchange of files between community members. The respective indices are updated every time a user logs on or off to the service. User information is centrally stored on the servers. Following a search request, files are therefore quickly and efficiently located and immediately available for downloading from a peer computer.

The Decentralized Model

The second main model of P2P file-transmission (mainly associated with open source developments such as Gnutella or Freenet) does not employ central indices to keep track of connected users and shared files, but works in essence as a user-based search engine that expands its search exponentially. A query is sent to a networked computer which forwards this query to a specified number of other computers actively running the software.

They will pass on the query to further computers on the network and so forth. If one of the computers in the network has a file which matches the request, it transmits the file information (e.g. name and size) back through all the computers in the pathway towards the sender of the query. The sender will then be able to open a direct connection with a networked computer that carries the file and to download that file directly. No user information is centrally stored.

B. Economic Potential of P2P-technology

From an economic point of view, P2P file-transmission has the potential to revolutionize Internet communication and to become the basis for the next generation of the Internet. Indeed, P2P file-transmission technology improves current Internet applications significantly:

- Any workable P2P infrastructure will result in the formation of *special interest communities*. Such communities increase the stickiness of Internet users to a given service. A music community, for example, attracts and keeps music lovers on a P2P network that specializes in the dissemination and sharing of music files. The same is true for other topic-related communities that intend to exchange information within a network of peers with similar interests.
- *P2P search engines* may solve the problem of finding recent and changing content. Today, the majority of individuals search for content on the Internet by using ordinary search engines. Current search engines, however, are imperfect, as they index only a small fraction of available websites. So-called web crawlers that automatically index websites, miss about half of the Web's content, and the indices they create are at least 24 hours, sometimes even months old. In contrast to this, P2P search engines find content that is on every computer in a network at the very moment of the search, giving users immediate and accurate results.

In addition, P2P search engines are focussed on the specific network of their respective community. Its ability to provide up to date information on shared material could, for example, ease and improve online marketplaces by giving each user the possibility to share his latest product information and prices at any time.

- The *dissemination of information and other material* through P2P networks may also represent an improvement compared to ordinary server/web-based distribution. A connected hard drive is immediately accessible for everybody interested in a specific topic. No upload to a web server or translation into HTML language is required. It is not necessary that a web-based search engine indexes the content in order to be found. Thus, large pools of information and other content will be accessible to researchers, students, or working groups within a company or association.

C. Challenges for Digital Rights Management

The ease to exchange content and information within a P2P network has raised a number of problems. From a business, legal and technical perspective, the most serious issue is the protection of intellectual property.¹²

In the digital era, the uncontrolled or illegal replication of copyright material through P2P file-transmission is a danger that must be taken seriously by all those who want to employ P2P-technology on a commercial basis for content distribution. Whereas the centralized model of P2P technology allows for a certain level of

¹² There are other issues that have to be explored such as bandwidth requirements and the attitude towards privacy in a world where any computer of a P2P network can potentially connect to any others hard drive in the same network. These issues will not be dealt with in this paper, as its scope is restricted to DRM and copyright.

control based on the existence of central indices, the threat to rightsholders and their works is particularly high within a decentralized P2P-model. Decentralized P2P systems lack all forms of central infrastructure and are currently impossible to police.

Any proactive business approach to P2P file-transmission will have to promote ancillary technologies, which guarantee robust copyright protection, e.g. digital rights management systems. Digital rights management in the P2P environment should in particular be designed to:

- Ensure full respect for intellectual property rights;
- Ensure payments for rightsholders; and
- Provide adequate protection against illegal copying and distribution of copyrighted works.

However, having regard to the specifics of the P2P environment, digital rights management systems should also observe a number of principles in order not to nip the economic potential of the P2P technology in the bud:

- *Usability* is of great importance. Digital rights management in the P2P environment, therefore, should preserve the user-friendliness of P2P services. One should not ignore that the enormous appeal of P2P communities is the ease of their use.
- The *community principle* should also be respected on a technological level. The security architecture of rights management in the P2P environment should be tailored to the requirements of a networked online community; the security architecture should not be restricted to a server-end user pathway. Therefore, classical features such as access control, authentication of users and encryption should be designed to function as parts of an integrated system with further features such as digital finger printing and copy control systems. Anchoring intellectual

property to a single device would not be compatible with the community principle of P2P file-transmission.

- Digital Rights Management systems dedicated to the P2P environment should be *platform-agnostic*, meaning that interoperability between various end-user operating systems and devices should be ensured. This interoperability should be achieved by means of commercial negotiations with stakeholders and/or an appropriate standards-setting process. While digital rights management in the P2P environment should grant *end-to-end technical protection system*, i.e. the maintenance of control over intellectual property at all times, the system should be appropriate for the respective community and the use of the exchanged digital content. The employed spectrum of digital rights management features should guarantee the necessary flexibility within a given network, while fully respecting and preserving the value of the digital content. The chosen technology protection system should, at the same time, preserve the integrity of the service provider's equipment and network.
- *Legislative protection* that is granted to technical protection measures, should also be applied in the P2P environment to integrated protection systems as such. Moreover, some jurisdictions reinforce the protection of technical protection measures in the case of interactive on-demand services. These provisions, mainly drafted with regard to classical server/end user services, also have to be applied to P2P services. Equally, P2P services offer access on agreed contractual terms to intellectual property irrespective of the time and the place a community member chooses an item.

In summary, business models based on P2P technology require a proactive approach to intellectual property, in partnership with all stakeholders, in order to serve as an effective

means of making more digital content available. In no event should business models be based on the infringement of intellectual property rights. As a matter of principle, this challenge could be met by developing secure membership-based services, organised in a centralised P2P network. They would preserve the spirit of P2P file-transmission while at the same time guaranteeing the protection of valuable digital works and meeting the technical needs of service providers.