

# Multimedia Copyright Enforcement on the Internet

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## Panel Statement.

Technology has made it simple and economical to reproduce, distribute, and publish digital information. While enabling increased legitimate uses of digital media, the potential for misuse is multiplied many fold. Increasing Internet piracy is already producing a billion dollar loss in revenues per year to the music industry. As Internet bandwidth increases, the movie industry is expected to follow the same path. The dynamics of the process is disturbing: for example, Napster's music download web site has experienced a nearly six-fold traffic increase in the second quarter of 2000.

It appears that the content publishers have only few options to fight this agonizing problem: (i) seek for legal ways to enforce their copyright, (ii) change their business model e.g., by collecting revenues, through advertisement rather than music sales, and/or (iii) research new technologies that will raise effective barriers for illegitimate use of digital content.

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While technology is progressing fast, the judiciary system is slowly adjusting to new situations. In the case of content "hard-copying", the legal recipe is to seek for damages from the recording (e.g., CD) plant. However, this model does not translate well to content "soft-copying". Although, Napster and Scour, as main enablers of free multimedia content distribution on the Internet, are facing a number of lawsuits, it is not clear how the current laws apply to these cases.

- \* Which party is liable in the process of up/downloading pirated content to/from a server?
- \* What are the legal issues with transferring pirated content using different Internet technologies such as email and push?
- \* Where are the boundaries between legal and illegal copying?
- \* How to address the copyright enforcement problem worldwide?

Many content publishers are already investigating ways to change their business models and adjust better to the Internet era. The most commonly mentioned business model is free content distribution and collection of revenues through advertisement. The total spending on advertisement in the US economy in 1999 totaled \$218B. Advertising on the Internet accounted for a small part of that sum, however, it is the most rapidly growing sector: currently \$1.8B per quarter with approximately 50% quarter-to-quarter increase.

- Is this a viable source of revenues for content publishers? The music industry collected \$15B in 1999 in the US alone. The IFPI and RIAA claim revenues in excess of \$38B annually for the music industry worldwide.
  - \* What is the right business execution of this model?
  - \* How is this going to affect the relations of artists with the content publishers? Will artists be able to publish their work into the Internet space without the Hollywood management?

Some believe that digital rights management (DRM) technologies are the only road for multimedia content publishers. The industry has already created an initiative, the SDMI (Secure Digital Music Initiative), to address the problem for screening digital content from illegal use. However, this problem is complex from a technical point of view. Multimedia watermarking has a crucial role in such systems as the only known protection technique that can survive D/A and A/D conversion of the signal. For example, by encrypting or scrambling a signal, a DRM system can only enforce copyright protection while the signal is in the protected form; once it is decrypted or unscrambled, it can be recorded or copied (in its digital or analog form) and freely distributed.

A number of techniques have been proposed for watermarking text, audio, images, and video to enable the enforcement of copyrights. Although each of the corresponding media industries desperately calls for a consensus on standards, the associated technical standards initiatives, such as the SDMI, have had little success due to a variety of reasons: legal and business model issues, DRM system design, inability to provide adequate testing, and lack of reliable watermarking technologies.

- \* Is it possible to guarantee prevention of illegitimate copying using an information technology?
- \* What are the bounds of watermarking? Why watermarking is hard? What are realistic scenarios for watermark use?
- \* How (or is it possible) to build an effective DRM system?

Multimedia copyright enforcement on the Internet is a complex issue involving aspects of technology, the law, economics, sociology and public policy. The breadth of this panel reflects the multidisciplinary nature of the problem. Each panel member is an expert with a different perspective and a strong point of view.

## PANEL MEMEBERS

James M. Burger represents a wide variety of computer hardware, software and online companies on intellectual property, communications and government policy matters arising from the confluence of digital technology, content protection and government regulation. Jim has participated in resolving such complex issues as DVD copy protection and download and sale of music on the Internet - representing the Computer Industry Group in negotiations developing the DVD Content Scrambling System copy protection rules as well as the Secure Digital Music Initiative. Jim also represents clients in negotiating hardware acquisition, software licensing and online agreements. Prior to joining Dow, Lohnes, Jim occupied senior positions in Apple Computer's Law Department. For five years, he chaired the industry's intellectual policy committee at ITIC. Education: B.A., with honors, New York University; M.A., New York University Graduate School; J.D., cum laude, New York University School of Law.

Christopher J. Cookson is EVP & CTO for Warner Bros. He oversees the operation of the Technical Operations

Division, which is responsible for all video mastering, duplication, physical and broadcast distribution, reservation/archiving/restoration of film and tape for WB's motion picture and television divisions. As CTO, Mr Cookson is further engaged in defining standards for secure digital distribution of Warner Bros.' intellectual property. He has been instrumental in the development and launch of DVD and The Web, a new technology architecture for delivery of The WB Television Network. Mr. Cookson joined Warner Bros. in 1992 from CBS in New York where he was VP/GM, Operations and Engineering for the CBS Television Network. He is a fellow of SMPTE, a member of ATAS and a founding member of the Museum of Television and Radio Technical Council. He holds more than 17 U.S. patents and has been awarded two Emmys. Mr. Cookson holds a BSE degree and an MBA from Arizona State University.

Darko Kirovski received the Ph.D. degree from the Computer Science Department at the University of California, Los Angeles in 2000. He has been with Microsoft Research since April 2000. His research interests include: intellectual property protection, multimedia digital rights management, embedded systems security and design. He has co-authored more than 30 technical papers in journals and conferences and holds four US patents. Dr. Kirovski has received the Microsoft Graduate Fellowship in 1998 and the Design Automation Conference Fellowship in 1999.

David P. Maher has served as chief technology officer of InterTrust since July 1999. Before joining InterTrust, he was an AT&T Fellow, Division Manager, and Head of the Secure Systems Research Department at AT&T Labs where he was working on secure IP networks and secure electronic commerce protocols. He joined Bell Labs in 1981, where he developed secure wideband transmission systems, cryptographic key management systems, and secure communications devices. He was chief architect for AT&T's STU-III secure voice, data, and video products used by the President and US Intelligence and Military personnel for Top Secret communications. In 1992 Maher was made a Bell Labs Fellow in recognition of his work on Communications Security. He was also Chief Scientist for AT&T Secure Communications Systems overseeing Secure Systems R&D at Bell Labs, Gretag Data systems in Zurich and Datotek Systems in Dallas. Maher has published papers in the fields of Combinatorics, Cryptography, Number Theory, Signal Processing, and Electronic Commerce. He has been a consultant for the National Science Foundation, National Security Agency, National Institute of Standards and Technology, and the Congressional Office of Technology Assessment. He has a Ph.D. in Mathematics from Lehigh University, and he has taught Electrical Engineering, Mathematics, and Computer Science at several institutions.

Miodrag Potkonjak is an Associate Professor at the UCLA Computer Science Department. He received his Ph.D. degree in Electrical Engineering and Computer Science from University of California, Berkeley in 1991. In 1991, he joined C&C Research Laboratories, NEC USA, Princeton, NJ. Since 1995, he has been with Computer Science Department at UCLA. He received the NSF CAREER award, OKAWA foundation award, UCLA TRW SEAS Excellence in Teaching

Award and a number of best paper awards. His recent watermarking-based intellectual property protection research formed a basis for the Virtual Socket Initiative Alliance developing standard. His research interests include embedded systems, communication and multimedia system design, computational security, and intellectual property protection.

Jeremy Welt (bio not available at press time)