

Group Studies RFID to Stop Digital Piracy

UCLA researchers are developing the technological infrastructure behind RFID-enabled DVD players that would play only tagged DVDs.

By Mary Catherine O'Connor

May 12, 2005—A group of researchers at UCLA is working on a new RFID application that would provide consumers a means of watching DVDs of movies as soon as they hit the theaters. It could also be used to address one of Hollywood's biggest concerns: piracy of digital content. The group is researching a method of using RFID as a tool for digital rights management (DRM), wherein technologies are employed to protect media files from unauthorized use. Digital rights management is also used to process payment to compensate copyright holders for the use of their intellectual property. Apple computer's iTunes application, which lets users purchase music for 99 cents per song, is an example of a digital rights management platform.

The UCLA research group is developing the software and hardware components of a system that would embed DVDs with an RFID tag and DVD players with an RFID reader so that the tagged DVDs would play only in RFID-enabled players and only if the reader could authenticate the DVD's tag. In order to authenticate, the player would also need to link to some type of online network, similar to the EPCglobal Network, that would associate the DVD with a legal sale. Through this system, the copyright owners (the film production company and any other license-holders of the content) would have digital rights management over the work. But viewers would not be able to play the DVDs without an RFID-enabled player because the tag would essentially lock the disc.

The project is being developed by UCLA's Wireless Internet for the Mobile Enterprise Consortium (WINMEC), a research group based at UCLA that also is developing RFID middleware, sensor networking devices and online applications for mobile media (see [UCLA Consortium Holds RFID Forum](#)).

Rajit Gadh, professor in UCLA's Henry Samueli School of Engineering and Applied Science and director of WINMEC, says that the research going into the project is targeted at determining whether the concept is technologically feasible. "We're in the very early stages of this project—the first research stage," says Gadh. "We have different pieces of the technology and a pretty good idea of how it is going to fit together. But we don't have anything that we could demonstrate. We should begin to publish research reports on the project during the next six months."

Once the initial research work is complete, the group will begin building prototypes of RFID-enabled DVD players and tagged DVDs. A potential hurdle, says Gadh, will be interference from other electronics in the home that also use RF. The group will also need to develop a system for writing to the tags, a platform for associating DVDs with their purchasers or owners and a means of encrypting the tag data. The WINMEC group has developed a middleware platform called WinRFID that it will use in the development of the RFID/DRM project.

Any commercial application of the technology would be initiated and developed by film production companies, manufacturers of DVDs and DVD players, and any other relevant players. A method of distributing

proceeds for the rights to the films would also need to be established. "We don't know if it's ever going to happen, but we are creating the technology in case someone ever wants to create the business," he says.

"I don't know if this is going to reduce piracy," he adds, "but it would create a market where one does not yet exist." Gadh believes consumers would be interested in purchasing specialized early releases of DVDs, as well as the specialized DVD players needed to play them, if it meant being able to watch new releases at home as soon as they come out. He is quick to point out, however, that WINMEC is not the originator of the concept of developing a means to sell DVDs of movies while the films are also in theaters. He says he had heard people within the entertainment industry mention this concept before. WINMEC is researching just one technology that could be used for this application.

Within days of a feature film's release in theaters (and sometimes before its theatrical release) illegal DVDs of the film are often available, online or in illegal markets, says Gadh. These films are sometimes leaked to pirates by film industry insiders or are recorded with digital camcorder brought into a movie theater. The Motion Picture Association of America, a trade group that represents major Hollywood studios, estimates that the U.S. motion picture industry loses more than \$3 billion annually in potential worldwide revenue due to piracy.

The digital format of most films and music released today has led to its increased piracy. The quality of video and audio recordings based in analog technology, such as cassette or VCR tapes, decreases each time an original version is copied. When digital recordings, such as CDs and DVDs, are copied, however, no quality is lost. Also, it is easy to make many copies of digital recordings to sell as DVDs or VHS tapes. The MPAA says pirates with the right CD pressing equipment can produce thousands of perfect video compact discs (VCDs) or DVDs daily. Also, a number of file-sharing sites allow Web users to freely upload audio and video files. In the late 1990s, file-sharing Web site Napster was sued by German entertainment company Bertelsmann, which charged Napster with copyright infringement. Los Angeles-based Metro-Goldwyn-Mayer Studios is currently suing online music and video swapping site Grokster, also over copyright infringement.

Gadh says WINMEC is incorporating input it gets from its film, television and music industry contacts in the Los Angeles area as it develops this and other projects that have multimedia applications. He says WINMEC began looking into the potential uses of RFID in DRM after members of the consortium were discussing how quickly pirated versions of feature films become available online and on DVD. "We asked, 'Wouldn't it be great if there was a way to release a DVD on the first day of a film's release, but a DVD that is locked and which will only play on a certain number of machines?'" he says. This would give consumers a legitimate means of purchasing DVDs of films as soon as they are released. Gadh has asked a number of executives within the entertainment industry why the production companies do not just release DVDs of films as soon as they are released in the theaters but says he has never gotten a clear answer. He suspects, however, that is it has something to do with the loss in revenue that movie theaters would likely suffer.

Gadh presented the DRM project last week at UCLA during a one-day workshop with the National Science Foundation's WICAT (Wireless Internet Center for Advanced Technology) program. WINMEC has received a planning grant for the WICAT program, a national consortium of university research groups that are developing wireless Internet applications. The DRM project relates to WINMEC's broader work with wireless Internet applications because the platform for the rights management will ultimately be managed through a virtual network, similar to the EPCglobal Network. That network would be accessible through either wired or wireless Internet connections. The digital rights management project is one of six research projects that were presented at the event.