

PTProtectTM

DVD Anti-Rip Copy Protection Software
Primera Technology, Inc.

Executive Summary

The issue discussed in this paper is simple and straight-forward: the manufacturing, selling or distributing motion pictures, television programs and other video content without the consent of the copyright owner is illegal.

Film companies alone lose approximately \$4 billion worldwide to physical piracy. Optical disc piracy, a subset of the overall piracy market, is the illegal manufacturing, sale, distribution or trading of copies of motion pictures in digital disc formats including DVD, DVD-R, CD, CD-R and VCD. The problem is widespread. In fact, over 400 labs for illegal duplication and replication of audiovisual content are discovered every year in the U.S.A. alone, most of them in the New York metropolitan area. Miami, Florida, serves as the center of audiovisual piracy for Latin America (source: MPAA).

In general, film copyright piracy costs the U.S. economy more than \$20 billion a year. Attitudes by international governments toward protecting entertainment copyrights internationally "are beginning to improve as a result of copyright protection measures," according to Sumner Redstone, executive chairman and controlling shareholder Viacom Inc. and CBS Corp. in his keynote speech to the Seoul Digital Forum 2008 (source: Yahoo News)

The cost of unauthorized copying manifests itself in a number of ways. For videographers and production studios that produce short-run commercial and sensitive video content on recordable DVDs it is particularly challenging.

For example, lost revenue for training and wedding videos not sold due to piracy is generally believed to be directly proportional to the number that should have been sold. Confidential and sensitive content designated for a specific audience (for example in banking, oil, healthcare or fashion) that leaks to competitors or other interested parties can be devastating – not only for the content owner but also for the reputation of the video production studio or duplication company.

Freely available ripping programs are becoming ever more sophisticated at circumventing traditional copy protection methods. The Internet has become not only a repository of illegally ripped content, but also for the distribution of the ripping software itself.

What are the Choices for Protecting DVD Content?

To try and combat such activity, a number of DVD anti-rip solutions exist today. Each major category is briefly explained below.

Copy Protection by Introducing Bad Sectors

Some solutions physically add bad sectors which create patterns of weak sectors into the DVD format which are designed to make the content unreadable by ripping programs. The programs either fail to read the content or they attempt to skip the bad sectors and end up in infinite loops attempting to resolve the content. The downside is that the bad sectors can negate playback in some PC drives and DVD players. Today the more aggressive ripping programs are now able to rationalize these bad sectors by over writing them which then enables full copying.

Copy Protection by Introducing Bad Pointers

An alternative method is to insert incorrect format information. Format information is required on a DVD to tell the player how to play back the disc correctly. Bad pointers take effect after the disc has been ripped and a copied disc that contains the incorrect format data will not playback in a PC or DVD player. These errors were originally successful at confusing the ripping programs but no longer are. In addition, playability issues on DVD players and PCs are commonly experienced.

Hardware Software Protection

Another methodology involves a combination of a software copy protection mechanism on the DVD matched by a software program installed on the PC which combined together disables copying. However this methodology suffered numerous compatibility problems as newer PC drives were launched which has made this protection methodology more or less redundant. These solutions also require the use of proprietary optical media, limiting availability and choice of media.

Password Encryption

Encryption techniques can be used to protect content but this also requires a relevant codec resident on a PC that can read and decompile encrypted data. Introducing encryption on a DVD that requires a secure password to play the disc is only suitable for certain audiences and, similarly to the other copy protection techniques, today's ripping programs can and do circumvent password encryption.

Watermarking

Forensic watermarking provides an effective method for detecting the likely source of a leak after a DVD has been copied and distributed. For example, watermarking is a useful and valid tool for the distribution of pre-release movie "screeners" during the award seasons. A watermarked movie appearing on an internet site will likely be traceable back to a specific individual. This acts as a major disincentive and deterrent to uploading or copying if the

audience is aware that discs are watermarked. For small run commercial work, watermarking may be less relevant as the content is unlikely to be distributed, traceable and detectable in a similar way.

Encapsulation Software Protection (PTProtect)

PTProtect, from industry-leading disc publisher manufacturer Primera Technology, Inc., represents an entirely new method of protecting valuable video content. It is an effective and reliable technique that encapsulates DVD video content on a disc to prevent ripping programs from copying the content. At the same time, it ensures full playability is achieved. The encapsulation process is more fully described below.

How Does PTProtect Work?

PTProtect software is applied to the DVD image during authoring so that when content is burned to disc it is encapsulated with the PTProtect software. The encapsulated content on the DVD is then protected from access by common ripping programs. The content on the DVD is not modified in any way and, because the copy control encapsulation sits in areas of the discs not read by the DVD players, play-back quality remains unaffected.

PTProtect is a passive solution which means it does not load any software program onto the PC for the protection to work. In essence, PTProtect copy controlled discs are designed to provide effective "speed bump" protection from unauthorized casual copying.

Copy controlled discs have full playability designed to match the same playability levels in DVD players as unprotected DVDs.

Ease of Work Flow

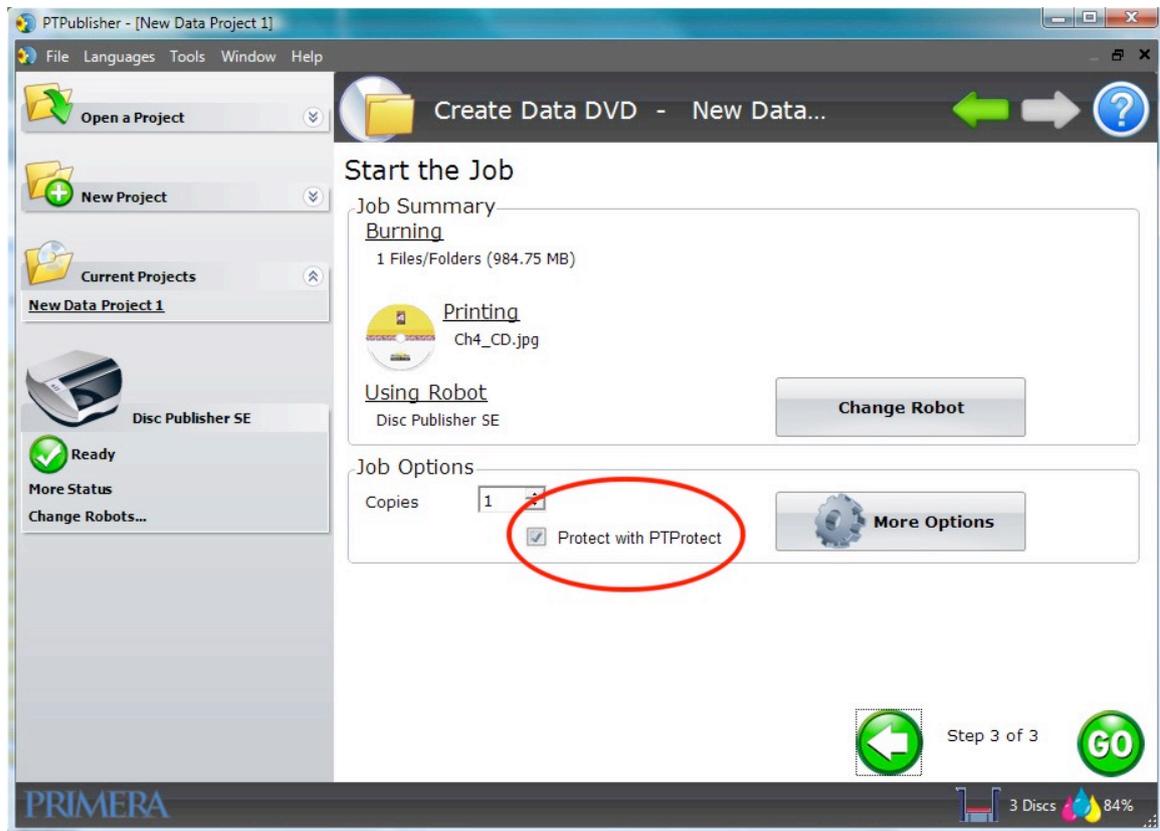
PTProtect is accessed with a single mouse click through Primera's PTPublisher disc publishing software. It applies the encapsulation protection to the ISO image file prior to burning the disc.

Once protected, the ISO files can be processed in the normal way for burning to DVD. It is a simple one-step process taking seconds or minutes to apply on the first disc of a run (depending on the size of the content). Very little overhead space is required, e.g. only 10MB on a full length DVD.

Protection is applied on a "click-charge" basis for each disc burned. Blocks of protection keys are conveniently purchased online at www.primerastore.com or through an Authorized Primera Distributor via low-cost, pre-loaded USB memory sticks.

If purchased online, protection keys are stored on virtually any local USB memory stick, allowing portability to other Primera disc publishers.

The user interface consists of a single “PROTECT” checkbox from within Primera’s PTPublisher Software:



What Types of Optical Media Can Be Protected?

PTProtect is designed specifically to protect DVD Video. Unlike other copy protection software, PTProtect also protects Dual Layer (DVD9) discs. All authoring features added such as menus, special features and extras are unaffected and remain as the original.

Work has already begun on a separate version of PTProtect for Data DVDs. For more information and availability, contact Primera Technology Europe in Germany at +49 (0)611 92777-0 or at sales@primera.eu.

Effectiveness and Compatibility

Independent Validation

Rigorous independent external testing that has been carried out on PTProtect DVD copy protected discs confirms reliable levels of protection from mass market ripping programs while also achieving full playability on DVD players.

DVD Playability Testing

Intellikey Labs, recognized by the world's top entertainment, media, manufacturing and software companies as one of the leaders in quality assurance testing for optical and digital media content, conducted detailed tests of compatibility of the PTProtect burn engine.

Compatibility was tested on a 103-DVD player test bed representing 83.40% of the DVD players sold in the USA between January 2003 and December 2005. The test concluded that all DVD players tested were able to play the disc and a single version of a Microsoft® Xbox™ 360 was unable to load the disc. The instance of a no-load represents approximately 0.12% of DVD play back devices.

DVD Protection Level Testing

PMTC-Testronic Laboratories are at the forefront of multimedia testing and are established as a leading independent quality assurance testing solution center for the home entertainment industry.

The object of the test was to make a copy of the sample discs in any form (full DVD copy / DVD rip to any format). The test is considered successful if all the movie content is copied to the hard drive of the PC and if this content is fully playable. The test included a representative cross section of Windows® and Mac® mass marketing ripping programs. The conclusion of the test was that the ripping programs tested were unable to copy the protected DVDs.

Software Security Testing

Next Generation Software Ltd. (NGS) is the world leader in the discovery and publication of computer security vulnerabilities. NGS confirmed that PTProtect's DVD copy protection software is passive and does not load computer programs to a PC. Security assessment: "NGS conclude that there are, in both the case of the protected DVDs no unexpected, undesirable, or malicious actions taken on the system upon which such a DVD or CD is used."

Summary

No copy protection is insurmountable; what can be digitally put onto a DVD can also be taken off. Therefore, it is important to set expectations appropriately.

The goal of PTProtect is to make DVD video copying very difficult for the average person, thereby protecting the rights and profits of copyright holders. It is intended as a robust yet transparent anti-rip solution that can significantly help to prevent unauthorized copying of discs.

Further, it is an upgradable software solution. New and innovative development continues to ensure that it provides the most reliable, efficient and easy to use anti-rip copy protection solution available.

For more information and pricing details on PTProtect, contact:

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