

Microsoft PlayReady Content Access Technology

White Paper

Microsoft Corporation

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Applies to:

Microsoft® PlayReady™ Content Access Technology

Summary: Microsoft PlayReady technology provides the premier platform for applying business models to the distribution and use of digital content. This white paper provides an overview of the features, business scenarios, and the technology ecosystem.

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## Introduction

Microsoft PlayReady content access technology provides the premier platform for applying business models to the distribution and use of digital content. With specific optimizations for mobile operators and handset manufacturers, Microsoft PlayReady enables a wide range of business models to be applied to virtually any type of digital content—including music, video, ringtones, images, games, and more. Whether you are looking to deploy purchase, subscription, rental, pay-per-view, preview, or super-distribution business models, Microsoft PlayReady will meet your needs—and provide easier-to-use entertainment experiences for your customers.

## The Evolution of Microsoft PlayReady

Mobile operators are continually challenged to increase revenues per subscriber and reduce churn in their subscriber base. Many operators have invested heavily in high speed data networks as a means to meet these challenges.

Products and services have already been deployed by operators to monetize these data networks, with many more planned. From a consumer standpoint, some of the most appealing offerings revolve around multimedia and, in particular, the delivery of music and video. Additionally, there is tremendous interest in other popular data services, including downloadable games and ringtones.

The deployment of commercial content services brings with it the need to ensure that the content is not widely distributed in unauthorized ways. Content access technologies provide a mechanism to protect content-owner rights, while enabling a range of new content-based services, and are a key enabling technology for mobile operators and handset manufacturers looking to increase revenues from data-based products and services.

Microsoft Windows Media® DRM technology has evolved greatly since its launch in 1999, adding support for an ever-wider range of business models. As a result it has been broadly deployed across the computing and Consumer Electronics industries. Mobile industry leaders such as Nokia, Motorola, Verizon Wireless, and NTT DoCoMo have adopted Windows Media DRM, adding to the millions of users of the technology worldwide.

Microsoft continues to work closely with leading service operators and handset manufacturers to understand how their requirements are evolving. Over the past few years, many have pointed to additional capabilities that they would like, but which are not supported in Windows Media DRM. Consequently they asked Microsoft to build content access technology specifically optimized with the needs of the mobile industry in mind. The result: Microsoft invested heavily to create new content access technology, called Microsoft PlayReady, which provides a major step forward to enable a wide range of new entertainment scenarios, products, and services.

## Microsoft PlayReady Ecosystem Overview

Content access technologies enable rights for digital content to be specified and enforced, to enable the secure distribution of digital content. The system enforces usage rules and may protect the content from being used in unauthorized ways. Usage rules can include expiration dates, whether the content can be transferred to a portable device, and more.

In use, Microsoft PlayReady protects content by encrypting data files. Since files are encrypted, the data itself is protected. Thus, the files may be moved, archived, copied, or distributed without restriction. There is no need to hide files, make them inaccessible, or put special protection in place when files are transmitted from system to system. In other words, there are no requirements for high security transport or storage mechanisms.

Each license contains rights and restrictions, defining exactly how the data in a file may be used, and under what conditions. For example, a music file license may contain a "right to play" but not a "right to burn to CD" and it might enable these rights for the period between September 1, 2008 and October 1, 2008. It is also possible that there will be multiple licenses for a single file. As long as one of those licenses grants the needed right, the user will be able to access the content.

Copying protected content and giving it to a friend will not necessarily enable them to use the content until they have obtained the proper license. However, PlayReady supports granting licenses for content to be consumed on a single machine or as a member of a domain specified by the content service. Because licenses need no longer be bound to a single machine, but can refer instead to a virtual entity (the domain), content sharing within the domain is easier. Protected content can be consumed by any user that is part of the domain. Additionally, PlayReady’s support of embedded licenses means that protected content that is bound to the domain can be simply transferred to any device that is part of the domain, and the content and its domain license can be backed up just like any other file.

The Microsoft PlayReady Ecosystem

The main elements of the Microsoft PlayReady Ecosystem are PC Clients, Devices and Servers. PlayReady Devices and PC Clients for playing back content are capable of acquiring protected content, interpreting a license, and enforcing the rules contained in the license.

PlayReady Servers include:

* **Content Packaging Servers**: Take in unprotected content and package it for distribution. When the content is packaged, the protected content is copied to a Distribution Server and the license information is transferred to a License Server.
* **Distribution Servers**: Are used to store and distribute content. Distribution Servers are usually Web servers but Microsoft PlayReady technology does not require a specialized Web server for content storage and distribution.
* **License Servers**: Store the content protection information and rights for using the content. Before a client can play back protected content it must acquire a license, typically from a license server (or the license may already be embedded in the content file).
* **Domain Controllers**: Are used to determine what the domain represents (a user, a family, or a group of users, for example) and holds a list of entities that are associated with the domain. The Domain Controller also enforces the policy defining how many devices or PCs may join the domain.
* **Metering Servers**: With metering, the device maintains a count of how many times a file is played. When the portable device connects to a computer or the Internet, this metering count is uploaded to the content provider. Metering does not alter or affect any behavior on the user’s system and does not identify the user. Metering allows the content provider to accurately assess royalties. Because metering can be more cost-effective, service providers can provide much larger music catalogs for customers to download.

Following is a high level illustration of how content and licenses flow between servers and clients to enable access to protected content.



## Microsoft PlayReady Features

### Core Enhancements

Microsoft PlayReady content access technology supports features found in DRM systems today, as well as enhanced features and functions designed to enable content distribution scenarios for the mobile communications industry. The following list provides a summary of the core enhancements of Microsoft PlayReady technology compared with Windows Media DRM.

| Feature/Enhancement | Description |
| --- | --- |
| Protection for many content types | Microsoft PlayReady supports essentially any type of content, including games, images, and ringtones, in addition to music and video. For audio and video content, support includes WMA, WMV, AAC, AAC+, enhanced AAC+, H.263, and H.264 codecs.  |
| Domains | From a consumer's standpoint it is very attractive to easily transfer content to all supported devices that they own, and be able to play back the content on all those devices. Domains support in Microsoft PlayReady enables this capability, benefitting service operators by enabling the delivery of an enhanced user experience. Customers can enjoy content from the operator’s service on all the devices joined to the domain.The domain registration phase allows the service provider to verify that the number of devices already registered with the domain hasn’t exceeded the service’s defined number, and that the device is an authentic PlayReady device, so the service can issue a domain certificate.All devices that support Microsoft PlayReady technology—from a PC to a mobile device—can be part of a domain. Registering and unregistering phases can be performed using any type of connectivity. It is not even required for a device to be connected to be unregistered; the service may be built so that this can be performed if desired from any Internet connected device already on the domain.The functionality provided by the Microsoft PlayReady Domain feature is very intuitive from an end user experience: the service provider allows the user to designate a group of devices as a “domain.” Any device on the domain can consume Microsoft PlayReady-protected content that is acquired by any other device in the domain, if they have a domain-bound license for the content. The user may easily add or remove devices from the domain, as long as the total number of devices (and PCs) in the domain does not exceed the limit defined by the service. |

|  |  |
| --- | --- |
| Feature/Enhancement | Description |
| Embedded License | PlayReady provides the option to have the content license be embedded in the content file itself, rather than distributed separately. This enables more seamless scenarios for consumers, whether moving content from PC to device, from device to device (including when upgrading devices), or when backing up protected content. |
| Backward compatibility with Windows Media DRM | Content services, media players and devices that support Microsoft PlayReady can provide backward compatibility with Windows Media DRM. A Microsoft PlayReady based portable device has full support for Windows Media DRM 10 content, licenses, and services, and therefore can acquire content from both existing Windows Media DRM and new Microsoft PlayReady-based services.A service provider who is running a Windows Media DRM 10 license server application can add the Microsoft PlayReady Server Software Development Kit v 1.0 to the Windows 2003 Server without needing to modify the licensing application. This enables the service provider to migrate to Microsoft PlayReady in manageable stages, and also helps to optimize use of server hardware. A license server application can support both Windows Media DRM clients and Microsoft PlayReady clients concurrently. The server can easily identify which kind of client it is dealing with, and issue appropriate content and licenses for either. |
| Performance enhancements  | Performance of key areas affecting the user experience has been enhanced to improve the responsiveness with protected content compared with Windows Media DRM. Specifically, new methods to store licenses in the license store have enabled a faster lookup time and faster storage time, making both playback and storage of protected content faster. These changes, along with the use of the Extensible Media Rights (XMR) expression language, provide a smaller more efficient license store. |
| Rights visibility | Microsoft PlayReady enables programmatic access to the rights information for a piece of content so users can be provided with more transparency about their rights to use the content. This allows content services, software vendors, and device manufacturers to provide users with information such as if the content can be played or copied, or whether the license has expired. |
| Enhanced developer experience | Microsoft recognizes the importance of providing a porting kit that allows a good device developer experience, enabling a rapid time to market. The Microsoft PlayReady porting kit is easy to integrate and deploy. The documentation is intuitive and easy to use. The code is well documented, with useful comments and descriptions of the functions, data types, and error codes. The code has been validated across multiple platforms so the engineering team can have greater confidence the porting kit will work on their platform. |

### Enabling Business Models for Digital Content

Microsoft PlayReady technology supports a wide range of business models for delivering digital content. Business models supported by Microsoft PlayReady for all digital content types include:

| Scenario | Description |
| --- | --- |
| **Subscription** | Subscription functionality allows a Service Provider to charge a flat rate for access to any and all content in the service provider’s catalogue. Microsoft PlayReady supports subscription business models through three mechanisms:First, the license issuer can specify the length of time for which a license is valid, ensuring that if a subscriber fails to maintain payments for their subscription, access to the content will eventually expire. If the subscription is kept in good order, the licenses are renewed prior to their expiration with the result that the user enjoys uninterrupted playback.The second mechanism, called Metering, involves the device maintaining a count of how many times a file is played. When the device connects to a computer or the Internet, this metering count is uploaded to the content provider. Metering does not alter or affect any behavior on the user’s system, and does not identify the user. Metering is provided to allow the content provider to accurately assess royalties. The third mechanism is license chaining. This enables a service to deliver each user only one new (master) license per subscription period to maintain the user's access to all the content on the user's PC or device, rather than what could have been literally thousands of licenses for individual content items. |
| Purchase | In this scenario, consumers purchase and download tracks protected with Microsoft PlayReady from content service providers on a per-track basis as opposed to the subscription model. |
| Pay per view | Microsoft PlayReady supports pay-per-view scenarios for all content types. |
| Rental | Microsoft PlayReady makes possible rental scenarios by supporting time-based licenses. This means that, for example, movie download services can create licenses that satisfy consumer viewing habits while ensuring that the content is used in the way the content owners intended. For instance, consumers might rent a movie that allows them to begin viewing it anytime within 30 days, and for 24 hours once they start playing it.  |
| Purchasing rights for another user ("Gifting") | Microsoft PlayReady supports the ability for one person to effectively pay the other person’s fees for accessing the service or its content. The gifting experience is service provider defined, while the giftee experience is identical to the Basic Download, Progressive Download or Streaming experiences described below. |

### Distribution Options:

Microsoft PlayReady supports a number of different options for distributing content:

| Feature | Description |
| --- | --- |
| Basic and progressive download | A file can be delivered in its entirety to local storage on the device and then played back assuming a valid license is available. (This is the “basic download.”). Alternatively, with “progressive download,” the file can be played when only a small portion of the file has been delivered to a device buffer, provided the rest of the file is delivered in parallel to playback. The media playback application is expected to be able to render files in exactly the same way regardless of whether they are downloaded completely or progressively. |
| Streaming | Content located on a streaming server is transmitted across a network in a continuous flow and then played by client software, without the entire content file needing to be stored on the client. By streaming data, a player can begin rendering the content immediately instead of waiting for an entire file to be downloaded. The media playback application is expected to be able to render files in exactly the same way regardless of whether they are streamed or played from local storage. |
| Sideloading content from PC to mobile phone | Sideloading content from a PC to a mobile handset is a popular feature with a playback experience similar to the Basic Download experience. Portable media players sync with PC media players to download both directly selected items and any dynamic playlists that the user has set up to be automatically transferred to the device.  |
| Over the air distribution with direct license acquisition | Microsoft PlayReady supports Direct License Acquisition Over-the-Air (DLA-OTA). This enables a mobile operator to deliver content and the rights necessary to play that content to a mobile handset directly over their wireless network, as opposed to via sideloading from a PC. |
| Super-distribution | Super-distribution refers to various distribution mechanisms allowing users to send content to other users. The distribution channel for such a transfer can include email, MMS, ad hoc WiFi, Bluetooth synchronization, or just physically passing a flash memory card to the recipient. The goal of mobile operators is to monetize this distribution channel or to create greater end user value in the content from the mobile operator’s service. Microsoft PlayReady technology enables users to share content, such as music, video, ringtones, and wallpapers, in a secure and seamless manner. By supporting a variety of super distribution scenarios, Microsoft PlayReady also offers additional monetization opportunities for mobile operators.The key feature unifying the above usage cases is the ability for an end user to distribute protected content to a friend who can then obtain a license from the service provider. Microsoft PlayReady is agnostic to the content distribution channel, therefore, few differences exist between super-distribution of content and distribution directly from a service provider.  |

## Now Available: Microsoft PlayReady Porting Kit v1.1

The Microsoft PlayReady Porting Kit contains ANSI C source code that is designed to help developers create portable devices for use with digital content that was protected with PlayReady technology. With this porting kit, Microsoft PlayReady technology can be translated to a wide variety of system architectures using different operating system environments and various device classes such as telephones, set-top boxes, and portable media players.

Components

The porting kit includes:

* The ANSI-C source code form of Microsoft PlayReady.
* A readily-deployable implementation.
* Applicable test certificates.
* Specifications and associated documentation and libraries in object code form.
* Media, printed materials, and online documentation.

## Now Available: Microsoft PlayReady PC Software Development Kit v1.0

The PlayReady PC Software Development Kit enables developers to create and distribute Windows PC applications that support PlayReady content access technology.

Components

The PlayReady PC SDK includes:

* Specifications and associated documentation and libraries in object code form.
* Security level 150 test certificate.
* Media, printed materials, and online documentation.

## Now Available: Microsoft PlayReady Server Software Development Kit v1.0

The PlayReady Server Software Development Kit enables independent software vendors, network operators, and content service providers to develop and deploy PlayReady Server applications.

Components

The PlayReady Server SDK includes:

* Specifications and associated documentation and libraries in object code form.
* Media, printed materials, and online documentation.

### Related Products and Documentation

Related products and documentation include:

* Media Transfer Protocol porting kit (MTPPK): Enables content transfer on portable devices.
* Windows Media DRM for Portable Devices Vendor Extensions to Media Transfer Protocol: Describes the extensions to the Media Transfer Protocol that enable ILA Windows Media DRM scenarios.
* Codec Porting Kit: Enables content encoding in the WMA and WMV formats.
* Windows Media DRM for Network Devices Specification: Specifies the protocols used for Windows Media DRM for Network Devices.