

Adobe® Flash® Access 2.0

Realize new sources of revenue and extend your market reach with a robust video content protection solution

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Video delivery over the Internet is growing rapidly. With a click of the mouse, consumers can watch concerts, movies, television shows, and made-for-Internet video. Film studios, television networks, and online content retailers share common goals: maximize potential revenue by expanding their reach; manage the integrity of valuable intellectual property; and create convenient access and an engaging experience for users.

Adobe Flash Access provides new ways for you to monetize and offer seamless access to premium audiovisual content.

Adobe Flash Access overview

Established media companies and startups are both striving to strike a balance between access to and control over online content. Flash Access 2.0 combines the unprecedented reach and interactivity of the Adobe Flash Platform—including the ubiquitous Flash Player and Adobe AIR®—with robust security and flexible usage rules. Your business can easily connect users with premium content, while enforcing necessary constraints, such as limiting viewing to a given rental period.

Flash Access lets you confidently deliver premium content securely to the widest possible audience using your chosen business models and distribution infrastructure. Flash Access supports a wide range of business models, including video-on-demand, rental, and electronic sell-through. You can distribute content protected with Flash Access by streaming through Flash Media Server using Real Time Media Protocol (RTMP), HTTP progressive download, or permit downloads to a content library for local playback at the consumer's convenience.

Flash Access allows you to combine persistent content protection with the rich interactivity and flexibility of Flash. You can seamlessly integrate branding and advertising, strengthening relationships between content owners, distributors, and advertisers. Content remains protected throughout its lifecycle, including at various stages in the distribution chain, reducing some potential security exposure.

Unprecedented reach

Flash Access works with client applications based on Flash Player or Adobe AIR, the multiplatform runtimes that power over 75% of all online video, ensuring the widest possible audience for your video content. With Flash Player support for in-browser experiences and Adobe AIR support for out-of-browser experiences, Flash Access extends your market reach to virtually every Windows®, Mac OS, or Linux® computer.

Persistent content protection

Today some of the leading online distribution companies use Adobe technologies to protect their streaming video. Building on this success, Adobe is extending these content protection solutions with a more powerful and robust solution that enables new usage models such as electronic sell-through (EST).

Flash Access protects standards-based MPEG 4 (H.264) content as well as the FLV file format, and supports distribution through progressive download, streaming, and download for local playback. You can protect content before you transfer it to the content delivery network (CDN), reducing the security exposure that might result from keeping unprotected files on edge servers. Content remains protected even after users have downloaded and viewed it, providing ideal security for download-to-rent and download-to-own business models. Only consumers who are granted access to a particular piece of content can play it. This limits misuse and piracy, since copying or moving the file does not allow other viewers to watch it without the proper authorization.

Flexible usage rules

Flash Access lets you associate content with usage rules, so you can keep track of valuable content and offer access to it in a variety of ways. For example, Flash Access can enforce time constraints on content for rental business models; support subscription business models through license linking; and bind content to a device or device domain for download-to-own scenarios. A client based on Flash Player or Adobe AIR enforces these rules on the user's device. For example, if you are renting content to consumers, you can define a collection of usage rules (called a policy) that grants a viewing period of two weeks. When the consumer acquires rights to a piece of content, Flash Access sets the expiration date in the content license. When the viewing window expires, the client can no longer play the content unless it contacts the server again and requests a new license.

New in Flash Access 2.0, you can assign multiple policies to a single piece of content, supporting different business models and multiple ways of generating revenue. For example, an online retailer can offer a television show for rental or purchase, and consumers can choose the option they prefer.

System integration

Flash Access is a software development kit (SDK) that easily integrates with existing subscription databases, e-commerce or payment processing systems, and portal management solutions. You can develop interfaces to standard and custom access protocols, existing order management and access control systems and more. Leveraging existing software and services allows you to create new services that will start generating new revenue rapidly.

To help you get up and running quickly, Adobe provides a reference implementation of Flash Access, which you can modify and customize to suit your particular environment.

Reach new audiences leveraging the Adobe Flash Platform

Flash Access is part of the Adobe Flash Platform, which provides everything you need to create and deliver a compelling video experience to the widest possible audience. Flash Access will protect content delivered to an upcoming version of Flash Player or Adobe AIR client applications. Flash Access optionally integrates with Flash Media Server and provides support for advanced features such as dynamic streaming for multi-bitrate content.

Flash Player is a cross-platform browser plug-in that delivers breakthrough web experiences to over 99% of Internet users. Over 75% of all online video—from short clips and live events to TV shows and movies—is viewed using Flash Player. Flash Access supports the upcoming release of Flash Player.

The Adobe AIR runtime lets you deliver branded rich Internet applications (RIAs) outside the browser that give you a closer connection to your customer. Adobe AIR uses the same proven, cost-effective technologies used to build web applications, so development and deployment are rapid and low risk. You can use your existing web development resources to create engaging, branded applications that run on all major desktop operating systems.

The choice of many broadcasters, Content Distribution Networks (CDNs), and online retailers, Adobe Flash Media Server delivers live and on-demand content to millions of users a day around the world via the ubiquitous Flash Player. Flash Media Server 3.5 supports streaming of content protected by Flash Access.

Since Flash Access operates independently of any transmission protocol, you can also securely distribute content to Flash Player using HTTP progressive download.

Leverage the Adobe Partner Ecosystem

It is simple to protect, monetize, and manage access to premium content by leveraging hosted secure infrastructure offered by Adobe partners. This Software as a Service (SaaS) model allows independent content distributors to accelerate time to market and reduce the cost of running a dedicated system.

Generate new revenue

Flash Access—together with Flash Player and Adobe AIR—gives content owners and distributors the features and flexibility to develop an engaging experience around premium content and generate new revenue streams. Content owners and distributors can license digital assets to users, as either a rental or a purchase.

Reduce costs

Studios can use Flash Access as a secure and cost-effective way to distribute pre-release content to retailers, curbing piracy. Enterprises, educational institutions, and professional training organizations can easily secure on-demand video communications with Flash Access, reducing costs associated with disseminating sensitive or private information to widely distributed groups or organizations.

Flash Access technology overview

A typical Flash Access deployment consists of a number of components (see Figure 1). A packager encrypts the contents of a video file in FLV or F4V format, inserting Flash Access metadata that can optionally include usage rules. A license server issues content licenses bound to one or more devices so that clients can decrypt and play content according to the usage rules. A Flash Access enabled client, such as the upcoming versions of Flash Player and AIR, acquires content licenses from a license server using a secure protocol.

The example workflow depicted in Figure 1 shows a typical online content retailer offering premium content to consumers. A CDN distributes the content. Different deployments will have different workflows. For instance, an enterprise or educational setting might not rely on an external CDN.

This workflow assumes that the end-user device has Flash Access enabled Flash Player or Adobe AIR runtimes. Upon installation, the Flash Access client contacts an Adobe-run individualization service that issues a unique key and certificate, allowing content to be cryptographically bound to a unique device. Occasionally, a client may re-individualize, for example, when the user upgrades to a new version of the client. The whole process is transparent to consumers.

Content preparation

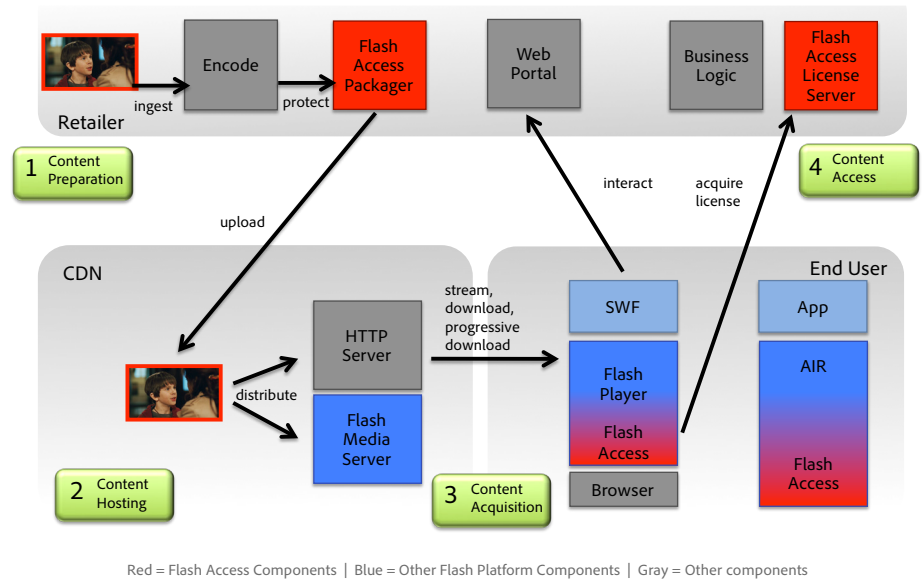
In this example, the retailer receives raw content (known as a mezzanine file) from the content owner and encodes it using tools such as Adobe Media Encoder, Flash Media Encoding Server, or a third-party encoder. Flash Access protects H.264 content in an MPEG4 (F4V) container as well as Sorensen or VP6 codecs in an FLV container. The Flash Access Packager then processes the video file, inserting DRM metadata and encrypting the video. Content management systems can integrate this step as part of video processing, using standard scripting languages or following the reference implementation included with the SDK. As part of packaging, the retailer has the option of associating a policy with the content. This has the benefit of reducing the complexity of the license server. The packager embeds one or more policies in the FLV or F4V file, and encrypts the file using a randomly generated content encryption key (CEK).

Content hosting

Once Flash Access packages the protected content, it can be transferred to the CDN. Since Flash Access protects content without tying it to any particular transmission mechanism, the CDN can stream content via Flash Media Server or distribute it from an HTTP server. The retailer can develop a video player using tools such as Flash Builder™ and leveraging standard components provided as part of the Open Source Media Framework¹ (OSMF) and package it as a SWF file for the CDN to host.

¹ See <http://www.opensourcemediaframework.com/>

Figure 1: Flash Access 2.0 workflow example



Content acquisition

Next, the user visits the retailer’s website, navigates the content catalog, and selects an item. The client runtime loads the video player SWF or AIR application and connects to the CDN to initiate download, streaming, or progressive download of the content. The client examines the content metadata, which includes the license server URL and any embedded policy information.

Content access

The client connects to the license server and provides its credentials and any available policy information contained in the metadata. The policy used can be one packaged with the content, or policies on the License Server can override the policies packaged with the content. Depending on the policy, the user may have to complete additional steps, such as entering a user ID and password. The license server communicates with the retailer’s business logic—including e-commerce or user database—and issues a license that is cryptographically bound to the client. Optionally, the retailer can allow the client to cache the license for a period so that it does not need to contact the License Server every time the user wants to play back this particular content. If the user is downloading content via Adobe AIR to a local content library, the client can play the content directly from the local library without being online (unless required by the usage rules).

Flash Access application examples

The following application examples demonstrate the flexibility and security features of Flash Access 2.0. They show how you can leverage existing Flash Platform and business logic components to reach new audiences and monetize premium audiovisual content.

Flash Access delivers advertising-supported content securely

In this example, a television network wants to offer viewers the option of watching a popular television show from their website via streaming or progressive download. Their key objectives include delivering an engaging and easy-to use experience that reaches the widest possible audience. They will also sell new advertising strictly for their Internet distribution, generating new revenue. Naturally, they want to ensure malicious users cannot record or redistribute their valuable program.

Flash Access lets the television studio’s Internet distribution arm easily and securely manage their content, while providing a new, lucrative way to provide quality entertainment to users. All a user needs to do is click on the show they want to watch, and the beginning of the stream triggers their Flash Player client to acquire a license. Since anyone can watch within the television network’s viewing area, the business logic is very simple. The acquired license is never

available in the clear on disk, foiling unauthorized recording (e.g. by raiding the browser cache). The network can use usage rules to protect content even further. For example, the network could disable license caching, so if users want to watch the same show again, they must return to the website and watch additional advertising.

Flash Access includes other security measures that help thwart piracy. Output protection controls for Windows platforms is a new feature in Flash Access 2.0. You can specify usage rules to require analog or digital outputs, providing additional safeguards against unauthorized recording.

Flash Access can work in conjunction with Flash Media Server to deliver an optimal viewing experience for the widest possible audience. For example, Flash Media Server 3.5 includes a feature called Dynamic Streaming that automatically adjusts to changing bandwidth conditions by switching between different bit-rates, ensuring a smooth flow of content to a user's browser. Flash Access protects content encoded at multiple bit-rates.

Flash Media Server creates playlists that allow advertising servers to dynamically insert pre- and post-roll ads, generating a new source of revenue. Flash Media Server can optionally check user domains or IP addresses against a white list, helping CDNs geo-limit access to content.

Flash Access allows authenticated users to rent movies over the Internet

In this example, an online retailer rents movies over the Internet for a major studio. Flash Access is the perfect choice. It allows the retailer to control who can view which movie, and for how long. Authenticated and authorized consumers can purchase and have movies streamed or downloaded to their desktop, while the client enforces any time constraints.

Flash Access 2.0 gives studios and online retailers the flexibility to offer different packages at different price points for the same video content. They can offer monthly "all-you-can-watch" subscriptions, or charge customers on a per-movie basis. Users can choose the option they prefer. Retailers can specify the number of days the rental contract is valid, or define a viewing window that begins as soon as the customer begins watching the movie. For example, a retailer may define a policy that grants a week-long rental period, but once the consumer begins viewing the content, they only have 48 hours to complete it. After the viewing or rental period is over, the movie will no longer play for the customer unless they acquire additional rights, sometimes known as "topping off". For additional security, retailers can ask their customers to supply a username and password each time they want to watch the movie, or only after a certain period has passed.

The solution is convenient for both retailers and their customers. The retailer can integrate the Flash Access SDK with their current user ID management and order management systems. Existing customers of the retailer do not need to create a new account with a new username, password, and credit card information. Both new and returning customers simply use the familiar Flash Player to acquire a content license and watch premium content at their convenience from their Mac, Windows, or Linux desktop. Once their credentials are verified, users can watch movies until the rental period is up. While many retailers choose to stream rented movies to Flash Player, they could also deliver movies via HTTP progressive download, or they could allow users to download movies to a desktop Adobe AIR application.

Flash Access also provides safeguards against misuse. Adobe manages and updates certificate revocation lists (CRLs) that License Servers download regularly. These CRLs can contain individual clients, versions of Flash Access clients, or versions of Flash Player or Adobe AIR that are deemed insecure. For example, imagine a user cracks a Flash Player or Adobe AIR client. When users want to watch new content, the license server checks the client certificate against the CRL and denies them a license. They may be required to download a new, more robust version of the Flash Access client in order to acquire new content. The SDK also provides an API for creating and signing private CRLs, which can be associated with the retailer's specific License Server.

Furthermore, Flash Access can detect if users have tampered with their computer clocks in order to gain a longer viewing window for their movie rental. You can stipulate the amount of time each way that users can legitimately change their computer clock before you deny them access to their movie rental.

Flash Access permits electronic-sell-through and digital copy

Several television networks and online retailers are already allowing customers to purchase television shows or movies, download them to their computer, and watch them at their convenience. This is called electronic sell-through. Similarly, some content owners and studios are offering digital copies of premium content to customers who buy DVDs or Blu-Ray discs.

Flash Access lets these content owners and distributors confidently deliver high-quality downloaded content to user desktops. Once a customer completes an online purchase, their Adobe AIR client downloads the content to their computer. Users have unlimited access to content, whether they are online or offline. The only constraint is they cannot send the content to their friends to watch on their computers.

Alternatively, instead of completing a purchase transaction, a customer can redeem a code provided with the physical media (e.g. BluRay disc) online to enable a digital copy for playback on the user's computer.

Flash Access lets studios securely and cost-effectively distribute pre-release "screeners" to retailers

DVD and Blu-Ray disc sales are one of the most profitable areas of operations for studios. Traditionally, studios have supplied major retailers early versions of their movies—called "screeners"—on DVD and Blu-Ray discs, so retailers can decide whether to carry the title. Studios ship these screeners at considerable expense, and yet have no guarantee of a secure trip from source to destination. While these discs employ copy protection, there have been instances where employees have stolen or appropriated discs, cracked their copy protection, and pirated the movie even before its official release to retailers.

With Flash Access, studios can now offer their retailers an affordable "e-screener" alternative, one with more robust security and guaranteed delivery mechanisms. An authorized employee can simply download an encrypted copy of the movie to their desktop. Only their desktop receives the license to play the movie. Studios can set the content to expire after a certain period, minimizing any opportunities for valuable content to fall into the wrong hands. Studios can also define output protection rules for further peace of mind.

Flash Access enables training and communications for distributed organizations

In distributed organizations, video communications is an efficient and cost-effective tool for education, training, and important corporate announcements, because it reduces or eliminates the time and expense associated with travel. Flash Access offers a convenient, secure way for organizations to distribute securely their valuable audiovisual content to employees, trainees, or clients in remote locations.

Flash Access allows enterprises, educational institutions, and professional training organizations to be precise in specifying who gets which content, and how, when, and how often they can view it. Organizations can offer online access to content, or grant offline playback for remote users. They can track if all employees view mandatory training, since organizations can tie Flash Access to their content or access control systems. They can control timely or sensitive communications by creating usage rules that expire the content at a certain date (for example, at the end of term), or after a short viewing window.

For enterprises used to protecting their intellectual property contained in electronic form, it is easy to justify using Flash Access to extend robust content protection and distribution to high-quality audiovisual content. With the video encrypted, only authorized users with a valid Flash Player or Adobe AIR application, username, and password can access the video, ensuring that confidential corporate communications will not end up distributed on the Internet.

Flash Access usage rules

With Flash Access, you can specify the following usage rules.

- A start and end date for the policy
- The amount of time the policy is valid—measured in seconds
- The time the user has to watch the content once they have started playback (also called the playback window)—measured in seconds
- Whether access can be anonymous or requires authentication
- Whether to allow license caching
- License caching period (in seconds)
- License expiry date
- Whether output protection controls are required on analog ports
- Whether output protection controls are required on digital ports
- Type of output protection control to apply (options are Required, Not Required, Use If Available, and No Playback)
- Whether license linking is supported
- Check against white list of SWF or AIR applications allowed to view the content
- Check against blacklist of client or runtime versions not allowed to view the content

You can also define custom properties for enforcing application-defined rights on the client.

You can program usage rules in the license server. Alternatively, you can define usage rules in a policy and then associate one or more policies with each piece of content during packaging. The policy is signed to avoid tampering and is distributed with the content. The client may send the policy when it requests a license. The license server can then verify the signature on the policy and either issue a license following that policy or override the policy packaged with the content and follow the policy or policies programmed into the server.

If you associate policies at packaging time, you can update them without repackaging the content by creating policy update lists and distributing them to the license server. For example, for a rental application, the online retailer may decide to modify the business model by extending the rental period from one week to two. New licenses issued after the policy update will specify the new period.

Summary

Flash Access 2.0 provides the ideal balance between access to and control of premium video content. Flash Access lets you confidently deliver premium content to the widest possible audience using your chosen business models. As a key part of the Flash Platform, Flash Access integrates with tools, servers, and clients in a complete distribution chain, from planning to protected playback. Offered as an SDK, it allows for seamless integration with existing back-end systems. On the client, with native support in Flash Player and Adobe AIR, protected content can be played back as part of an interactive, branded experience on any platform, vastly increasing the reach and appeal of your premium content.



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