Using Flash® Media Playback and Strobe Media Playback

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Chapter 1: A Quick Start to Media Playback

Websites use media players to give viewers the rich multimedia experiences they need and expect. An ideal player is full-featured and easy to use, and it should be simple for developers to customize and manage.

Flash® Media Playback and Strobe Media Playback let you focus on the overall user experience of video on your site, not on building and managing media players. Both players are designed for quick and easy deployment. And both provide seamless support for the advanced features of Adobe® Flash® Platform technologies.

Flash Media Playback is an out-of-the-box, feature-rich, free media player suitable for designers, content owners, IT professionals, and developers. It is designed to be your simplest deployment solution. You use a setup assistant to configure the player with a few mouse clicks. Because Adobe hosts the player for you, there's nothing for you to install or keep updated. And users experience fast downloads, because the player is stored in their Flash cache.

Strobe Media Playback provides more flexibility than Flash Media Playback, while still helping you get up and running quickly. Like Flash Media Playback, the Strobe Media Playback player is both free and easy to customize. Unlike Flash Media Playback, the Strobe Media Playback player is open source, available both as a compiled SWF file and as uncompiled source code. And, because it is a download, it can be deployed behind firewalls, where the Flash Media Playback player cannot.

Both players are based on **Open Source Media Framework (OSMF)**. OSMF is a pure ActionScript® 3.0 framework that gives developers complete flexibility and control in creating their own rich media experiences. For more information on Open Source Media Framework, go to www.osmf.org.

This document discusses both the Flash Media Playback and Strobe Media Playback players. Where something differs between the two, it is noted. Most of the information, though, applies to both.

Features

The Flash Media Playback and Strobe Media Playback players provide the following features:

- A standard appearance (the player's "skin" or "chrome") that is easy to customize with your own bitmap files.
- Playback for a wide variety of content types, including files of type FLV, SWF, F4V, MOV, MP4, JPG, and MP3; M3U playlists; and F4M metadata manifests.
- Support for both standard and advanced delivery methods, including progressive download, RTMP streaming, RTMP dynamic streaming, HTTP dynamic streaming, and live streaming.
- Automatic management of secure (DRM) content with Flash® Access™.
- Advanced playback, with digital video recorder (DVR) functionality, next/previous track seeking, and playlist navigation.
- Control of capabilities such as autoplay, autohide controls, poster frame definition, control bar positioning, and more, without the use of Flash authoring tools.
- Easy configuration with HTML or XML.

- Simple integration of third-party plug-in services such as CDNs, advertising, and analytics. The flexible architecture gives you the option of compiling plug-ins statically or loading them dynamically, so plug-in providers can perform immediate upgrades and versioning.
- Quality of service (QoS) enhancements, including optimized buffering and dynamic (multi-bitrate) streaming.

System requirements

Both players support the same operating systems as the Flash Player software does, and each requires Flash Player 10.0 to be installed. (For HTTP dynamic streaming or playing protected content from Flash Access 2.0, you must install Flash Player 10.1.)

The following are the basic system requirements to run the players. See the Adobe Flash Player system requirements for additional information relevant to your system.

Specification	Minimum	Recommended for High Definition (HD)
Resolution	1024x768, 1280x720	1920x1080
Processor speed	1 Ghz	2 Ghz
RAM	1 GB	2 GB
VRAM	128 MB	512 MB

Playing content with Flash Media Playback

Because Adobe hosts the Flash Media Playback player, there is nothing for you to install. The first time Flash Media Playback runs on a system, both the player and a preloader are downloaded automatically. For subsequent uses of the player, only the preloader (approximately 4k in size) is downloaded.

Playing content with Flash Media Playback requires that you provide a small amount of HTML code on your web page. To start, go to the Flash Media Playback site, review the user agreement, then proceed to the setup assistant page.

The setup assistant creates the code that you copy into your web page. It can provide code for a wide variety of options for your player, but you need just two values to begin:

- The location or "source" for the content that you want to play. You provide this information in the form of a URL, specifying the file hierarchy for where the content is located.
- The size to display the player window. You give this information with separate values for the window's width and height. Each value is specified either in pixels or as a percentage of the size of the browser window.

When you supply these values to the setup assistant, it translates your information into HTML code. You can then copy and paste this HTML output into the code for your page. After you load your page, the Flash Media Playback player is ready to go, with its default settings activated and your content loaded.

Playing content with Strobe Media Playback

Playing content with Strobe Media Playback requires you to place a small amount of HTML code on your web page. However, because the Strobe Media Playback player is not hosted by Adobe, you must first install it on your computer.

Installing Strobe Media Playback

Go to the Strobe Media Playback site and review the user agreement. Strobe Media Playback is an open-source project, licensed under version 1.1 of the Mozilla Public License. For more details, see opensource.adobe.com.

1. Download the Strobe Media Playback zip file.
2. Find the root directory for your web server. It is typically named "htdocs", "html", or "public_html".
3. Create a folder inside the root directory. Open the zip file, and extract the zip contents there.
4. Open your browser and point it to the StrobeMediaPlayback.html demo page that is included in the zip file. Run the demo to confirm that you have successfully installed the player.

Running Strobe Media Playback

To run Strobe Media Playback, you create a small amount of required HTML code yourself, then embed this code in your web page. There are three pieces of information that browsers require to run the Strobe Media Playback player:

- A URL providing the location of the content to play.
- A URL for the location where you installed the player.
- Height and width values for the size of the player window to display. You can specify these either in pixels or as a percentage of the size of the browser window.

You specify each of these using HTML `object` and `embed` tags. (Using both `object` and `embed` is recommended to ensure backward compatibility with older versions of some browsers.)

For the required `object` tag values:

1. Provide dimensions for `width` and `height`.
2. Use the `movie` parameter for the location of the player.
3. In the `FlashVars` parameter, use `src` to set the location of the content.

That is all that's required. It is recommended that you set `allowFullScreen` to `true`, to take advantage of the player's full-screen capability. And, for your own debugging purposes, you may want to set `allowscriptaccess` to `always`.

For the required `embed` tag values:

1. Provide dimensions for `width` and `height`.
2. Use the `src` parameter for the location of the player. (Note that this syntax differs from that used for the player location with the `object` tag.)
3. In the `FlashVars` parameter, use `src` to set the location of the content.
4. For strict XHTML compliance, you should set the `type` parameter to `application/x-shockwave-flash`.

As with the `object` tag, you can also set `allowfullscreen` to `true` and `allowscriptaccess` to `always`, if you want.

You can customize the following HTML code sample for your page. Simply replace the sample values in the code with values for your own content location, player location, and size.

```
<object classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000"
codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=10,0,0
,0"
width="470" height="320">
    <param  name="movie"
            value="http://myserver.com/strobe/StrobeMediaPlayback.swf"></param>
    <param  name="FlashVars"
            value="src=http://myserver.com/mymovie.flv"></param>
    <param  name="allowFullScreen" value="true"></param>
    <param  name="allowscriptaccess" value="always"></param>
    <embed src="http://myserver.com/strobe/StrobeMediaPlayback.swf"
        type="application/x-shockwave-flash"
        allowscriptaccess="always" allowfullscreen="true"
        width="470" height="320"
        FlashVars="src=http://myserver.com/mymovie.flv">
    </embed>
</object>
```

Chapter 2: Configuring the Player

There are two ways you can customize your player. The first is to change how the player works by configuring its features. The second is to change the player's appearance. For both the Flash Media Playback and Strobe Media Playback players, making these changes is easy.

For the Flash Media Playback player, the process of feature configuration is the same as for playing content. The setup assistant produces HTML code that reflects your configuration choices, and you copy and paste that code into your web page. If you are using Flash Media Playback, all you must know is what your configuration options are and what effects they create.

For Strobe Media Playback, as for playing content, you must create the code to configure the player yourself. However, this process is as simple as it was for playback.

All feature configuration settings are optional. Both players' features are by default set to values that meet the needs of most users.

Basic configuration options

The following table describes the basic configuration options you can set for your player. For Flash Media Playback, you change these settings with the setup assistant. For Strobe Media Playback, you set these options yourself as described in "Configuring Strobe Media Playback" on page 6.

Setting	Name	Possible values	Description
Media stream type	streamType	`liveOrRecorded` (default), `live`, `recorded`, `dvr`	The type of media stream to support. The default setting plays both live and recorded media, with no digital video recording (DVR) features.
Looping behavior	`loop`	`false` (default), `true`	Restarts media playback when the end of the file is reached. The default behavior for the player is not to loop.
Automatic playback	`autoPlay`	`false` (default), `true`	Starts playing the media automatically, without user input. The default behavior for the player is to require the user to start playback.
Play button overlay	`playButtonOverlay`	true (default), false	Displays a large Play button over the center of the player window before playback begins. The default value displays the button.
Method of scaling content	`scaleMode`	`letterbox` (default), `none`, `stretch`, `zoom`	Determines how the source content is sized within the player window. The default `letterbox` value allows the content to be resized to fit the player window, but constrains the dimensions of the content to maintain its original aspect ratio. A value of `none` does not allow the content to be resized. A value of `stretch` sets the dimensions of the content to that of the player window, possibly changing the aspect ratio of the content in the process. A value of `zoom` displays the content filling the player window, while maintaining its original aspect ratio; this may cause cropping of the content's horizontal or vertical edges.

Setting	Name	Possible values	Description
Control bar position	`controlBarMode`	`docked` (default), `floating`, `none`	The location where the player's controls are displayed. The default value sets the controls along the bottom of the player window. A value of `floating` displays the control bar hovering over the content, near the bottom of the window If a value of `none` is set, no control bar is displayed.
Control bar visibility	`autoHideControlBar`	`true` (default), `false`	Whether the player's controls are visible at all times. With the default value, the controls are not displayed unless the user is hovering the mouse over the player. With a value of false, the controls are continuously visible and may reduce the amount of the player window available to display content.
Background color	`backgroundColor`	*Hexadecimal*	The color, specified as a hexadecimal value, to use for the background of the player. The player background is visible when no content is being played. The default color is black.
Poster frame	`poster`	*URL*	A URL specifying a bitmap image to display in the player window before playback begins. If no default poster image is provided, the player displays the current background color.
XML configuration file	`configuration`	*URL*	A URL specifying the location of an XML configuration file. For more details, see "Configuring Strobe Media Playback with XML" on page 7
Player appearance/ "chrome"	`skin`	*URL*	A URL specifying the location of a file containing alternate images for the player's user interface elements. For more details, see "Changing the Appearance of the Player" on page 11

Configuring Strobe Media Playback

There are two methods to set configuration options for Strobe Media Playback:

- Use FlashVars in the `embed` and `object` parameters for the HTML code for your page.
- Provide a URL in your page's code that gives the location of an XML file containing your configuration settings.

The differences between the two methods can be most important in terms of scale. For an administrator of a large network, it is easy to create a single XML file that specifies standard player options. That file can then be referenced by individual web pages.

One other difference between the two methods is that while settings in XML configuration files *do* override the player's default settings, they *don't* override FlashVars set directly in the page's HTML code. Any configuration FlashVars in a page's HTML code are the final specifications for player options.

With either method, your options are set dynamically, meaning that your configuration choices are provided to the player at the time that it loads.

Configuring Strobe Media Playback with FlashVars

"Running Strobe Media Playback" on page 3 describes how to use FlashVars to specify the location of the content that you want to play. You can also use FlashVars to pass along configuration information to the player. When you do so, you instruct the player to ignore its default settings and use your customized choices.

Following the exact syntax for FlashVars is required. First, FlashVars must be placed within HTML `object` and `embed` tags. Second, the format of the FlashVars must be a set of one or more *"name=value"* pairs. Third, an ampersand (`&`) delimits each pair; for example, *"name1=value1&name2=value2"*.

The FlashVars marked in bold in the code below provide an example of the proper syntax. The tabs and bolding are used in the code for readability only.

```
<object classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000"
codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=10,0,0
,0"
width="470" height="320">
    <param  name="movie"
            value="http://my.website.com/strobe/StrobeMediaPlayback.swf"> </param>
    <param  name="flashvars"
            value="src=http://my.website.com/strobe/stufftoplay/content.f4m
                &streamType=recorded
                &loop=true
                &autoPlay=true
                &playButtonOverlay=false
                &autoHideControlBar=false"> </param>
    <param  name="allowFullScreen" value="true"></param>
    <param  name="allowscriptaccess" value="always"></param>
    <embed
        src="http://my.website.com/strobe/StrobeMediaPlayback.swf"
        type="application/x-shockwave-flash"
        allowscriptaccess="always" allowfullscreen="true" width="470" height="320"
        flashvars="src=http://my.website.com/strobe/stufftoplay/content.f4m
            &streamType=recorded
            &loop=true
            &autoPlay=true
            &playButtonOverlay=false
            &autoHideControlBar=false">
    </embed>
</object>
```

Configuring Strobe Media Playback with XML

For someone who must configure multiple players to the same set of options, saving the settings in an XML configuration file is the most efficient choice. You can still override these global XML settings by specifying alternate values in an individual page's HTML code, as described in "Configuring Strobe Media Playback with FlashVars" on page 7.

The following sample presents a brief XML configuration file that sets various options:

```
<config>
    <src>http://www.mywebsite.com/myVideo.flv</src>
    <streamType>liveOrRecorded</streamType>
    <loop>false</loop>
    <controlBarMode>docked</controlBarMode>
    <scaleMode>none</scaleMode>
    <backgroundColor>BF2900</backgroundColor>
</config>
```

Advanced configuration options

As with the basic configuration options, Flash Media Playback and Strobe Media Playback share the same advanced configuration options. Most of these settings control how the player manages bandwidth to improve the user's viewing experience. Additional advanced configuration options are described in "Other advanced options" on page 9.

You aren't required to adjust these advanced settings. The player's default options are designed to perform well for most users.

Bandwidth management options

Both players provide features to help users obtain seamless, high-quality viewing experiences, whatever their bandwidth. Each aims to start playback as quickly as possible, while still creating a viewing experience with few, if any, pauses in playback. The features that support this are dynamic streaming and optimized buffering.

With **dynamic streaming**, when the player senses a network bandwidth change, it responds by switching playback to a content file with a more appropriate bitrate. Playback can switch among content files depending on the current bandwidth. This avoids having to pause playback entirely.

Dynamic streaming requires you to have multiple bitrate versions of content for the player to switch among, but the benefits to the user are significant. For a network experiencing a temporary reduction in bandwidth, playback does not have to pause for the user. Instead, the player seamlessly shifts to using a lower bitrate version of the content that is playing.

If it is enabled, dynamic streaming searches for multiple bitrate versions of the content to play. If it does not find multi-bitrate (MBR) versions, dynamic streaming does not function. Dynamic streaming has no effect on live/DVR streams.

When **optimized buffering** is enabled, the player allows fast-start buffering for high-speed networks. For low-speed networks (where the network bandwidth is lower than the video bitrate), the player dynamically computes a buffer size that is sufficient to support continuous playback.

There are some situations where optimized buffering does not function. Examples are stream types where the duration of the video is undetermined (as for live/DVR streams) or when the bitrate of the stream is unknown or variable, as with MBR.

The following table describes the bandwidth management options for both players.

Setting	Name	Possible values	Description
Display buffering indicator	`bufferingOverlay`	`true` (default), `false`	The default value directs the player to display a visual notification when playback is paused to refill the buffer.
Allow dynamic streaming	`optimizeInitialIndex`	`true` (default), `false`	The default value allows the player to use dynamic streaming for multi-bitrate (MBR) content. When the user starts playback, the player uses the download speed of the network connection to select the optimal starting bitrate stream. This setting has no effect on live/DVR content.
Allow optimized buffering	`optimizeBuffering`	`true` (default), `false`	The default value allows fast-start buffering for high-speed networks and dynamic calculation of buffer size for low-speed networks. This setting has no effect on multi-bitrate or live/DVR content.
Minimum continuous playback duration	`minContinuousPlayback`	*Number*	The minimum amount of playback time without pausing to refill the buffer. The default value is 30 seconds. The player's optimized buffering algorithm uses this value to compute a target buffer size for low-speed networks.
Length of buffer to create before starting playback	`initialBufferTime`	*Number*	This value specifies the amount of the buffer (in seconds) that must be filled before playback begins. The default value is 0.1 second. If `optimizeBuffering` is set to `true`, the player uses this value when enabling fast-start buffering for high-speed networks.
Maximum allowed buffer length	`expandedBufferTime`	*Number*	This value specifies the maximum size of the buffer (in seconds) that the player attempts to fill, once playback has begun. The default value is 10 seconds. If `optimizeBuffering` is set to `true`, the player uses this value along with fast-start buffering to optimize buffering for high-speed networks.

Other advanced options

Both players provide additional advanced options you may configure.

Setting	Name	Possible values	Description
Vertical pixel limit for standard quality video	`highQualityThreshold`	*Number*	The maximum vertical pixel resolution for which the video is treated as being of standard quality. With resolutions greater than this value, videos are considered to be high quality. The default is 480, so videos with vertical resolutions of 720 pixels or 1080 pixels are considered to be high definition (HD) by default. The player uses this value to enable full-screen best practices, including disabling smoothing/deblocking filters for HD content. For standard definition content, the player enables smoothing/deblocking.
Produce full error messages	`verbose`	`false` (default), `true`	Whether to display detailed error messages for debugging. The default value (`false`) causes the display of simplified, user-friendly error messages.
Allow supporting media stores in a subdirectory of the root directory for media files	`urlIncludesFMS ApplicationInstance`	`false` (default), `true`	Indicates, for RTMP streaming URLs, whether the URL includes the Flash Media Server application instance or not. If `true`, then the second part of the URL path is considered the instance name, such as rtmp://host/app/foo/bar/stream. In this case the instance name would be 'foo' and the stream would be 'bar/stream'. If `false`, then the second part of the URL path is considered to be the stream name, such as rtmp://host/app/foo/bar/stream. In this case there is no instance name and the stream would be 'foo/bar/stream'. The default is `false`.

Chapter 3: Changing the Appearance of the Player

You can easily customize the look or "chrome" of your player's interface. This process is also known as providing a new skin for the player. Here are the basic steps:

1. Create a custom bitmap image for the part of the interface that you want to change (for example, the Pause button). If you don't provide a custom image for a piece, it appears with its default skin.
2. Save the bitmap image as a JPEG, GIF, or PNG file. (Using SWF files is not supported.)
3. In the code for your web page, specify the interface element to replace, and use HTML or XML to give the location of the image that replaces it.

Player interface elements

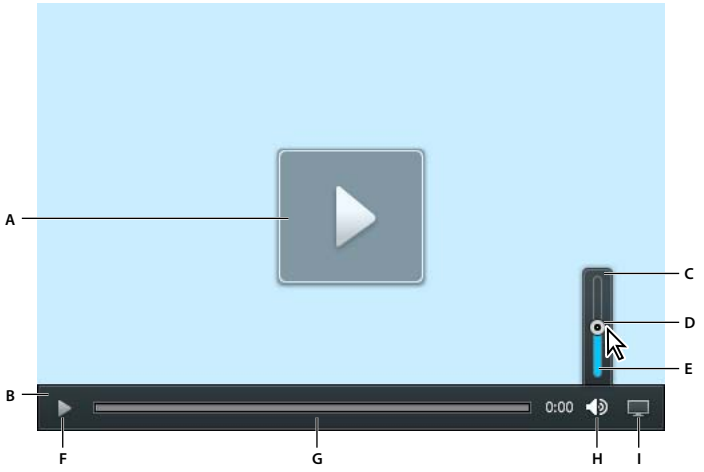
Before you start customizing your player's appearance, you must gather some information.

First, determine the element ID for what you want to change. The tables in this chapter describe each of the customizable pieces of the player's interface and give their IDs.

Next, notice that many items are associate with multiple names. These typically refer to the different states (such as active or disabled) in which the element can be displayed. For visual consistency, you should provide a new look for each state of an element.

There are no limitations on the sizes of your custom elements, but the default spacing between items is not adjustable. Therefore, if you create images that are much larger or smaller than the default size, the interface can become confusing. Also, there is currently no support for changing the default font, its size, or color.

Finally, note that not all interface elements are displayed at all times. Many parts of the player interface are only used with certain categories of content such as playlists or HD movies.



The player in a simple configuration with a default skin
A. *Play button overlay* ***B.*** *Control bar background* ***C.*** *Volume bar background* ***D.*** *Volume bar slider* ***E.*** *Volume bar track* ***F.*** *Play button* ***G.*** *Scrub bar track* ***H.*** *Volume button* ***I.*** *Full screen button*

Control bar backdrop and scrub bar control

The player's control bar is the horizontal strip that contains the player's controls. The control bar is by default located in a docked position at the bottom of the player window.

The scrub bar is a long, horizontal track; it is the largest single element on the control bar. The scrub bar is used to indicate the current state of media loading and playback.

Element ID	Default size (pixels)	Description
controlBarBackdrop	2 x 35	The background for the player's control bar. The image for this element is stretched as necessary to fill the length of the control bar's background area.
controlBarBackdropLeft	2 x 35	The left edge of the control bar background. This element creates a vertical border to the left side of the background.
controlBarBackdropRight	2 x 35	The right edge of the control bar background. This element creates a vertical border to the right side of the background.
scrubBarTrack	2 x 9	This image is used for the area of the scrub bar that represents unloaded content. The image for this element is stretched as necessary to fill the length of the track area.
scrubBarTrackLeft	2 x 9	The left edge of the scrub bar. This element creates a vertical border to the left side of the track.
scrubBarTrackRight	2 x 9	The right edge of the scrub bar. This element creates a vertical border to the right side of the track.
scrubBarLoadedTrack	2 x 9	The area of the scrub bar that represents loaded content. The image for this element is stretched as necessary to fill the length of the track's loaded-content area.
scrubBarLoadedTrackEnd	2 x 9	The edge of a scrub bar containing loaded content. This element creates a vertical border to the area of the track that represents loaded content.
scrubBarPlayedTrack	2 x 9	The area of the scrub bar that represents played content. The image for this element is stretched as necessary to fill the length of the track's played-content area.
scrubBarDVRLiveTrack	61 x 5	The track representing DVR-enabled content is drawn within the border of the standard scrub bar track. This image is used when DVR-enabled live content is being played.
scrubBarDVRLiveInactiveTrack	61 x 5	This image is used when DVR-enabled live content is paused.
scrubBarLiveOnlyTrack	61 x 5	The track representing live content is drawn within the border of the standard scrub bar track. This image is used when live content that is not DVR-enabled is being played.
scrubBarLiveOnlyInactiveTrack	61 x 5	This image is used when live content that is not DVR-enabled is paused.

Element ID	Default size (pixels)	Description
scrubBarScrubberNormal	9 x 9	The scrub bar control (also known as the "playhead" or "current-time indicator"). This element both indicates the current relative position of playback and provides an interface for the user to move playback backward or forward in time. In the normal state, the scrub bar control is active, but the user is not interacting with it.
scrubBarScrubberDown	9 x 9	The down state of the scrub bar control indicates that the user is currently selecting or dragging it.
scrubBarScrubberOver	9 x 9	The over state of the scrub bar control indicates that the user's pointer is hovering over the scrub bar control area.
scrubBarScrubberDisabled	9 x 9	The disabled state of the scrub bar control indicates that this feature is currently not available to the user.

Play/Pause button

The Play button and the Pause button are used together but do *not* appear concurrently. When playback is paused or has not begun, the Play button is displayed. Likewise, when playback is occurring, the Pause button is displayed. The Play and Pause buttons are displayed to the left of the scrub bar control.

Element ID	Default size (pixels)	Description
playButtonNormal	24 x 24	This image is used when the user has the option of starting playback, that is, when the content is currently paused.
playButtonDown	24 x 24	This image is used when the user has selected the Play button, but has not released it.
playButtonOver	24 x 24	This image is used when the user is moving the cursor over the Play button, but has not selected it.
pauseButtonNormal	24 x 24	This image is used when the user has the option of pausing playback.
pauseButtonDown	24 x 24	This image is used when the user has selected the Pause button, but has not released it.
pauseButtonOver	24 x 24	This image is used when the user is moving the cursor over the Pause button, but has not selected it.

Sound control

The sound control consists of two main parts: the Volume button and the volume bar.

The Volume button is located on the right side of the control bar. In addition to being displayed in "normal," "down," and "over" states, the button is also displayed differently depending upon whether the audio is set to a low, medium, or high level. When the user selects the Volume button, the player mutes the sound, and the Unmute button is displayed in place of the Volume button.

Displayed vertically above the Volume button is the volume bar. Its elements consist of a background, a track to indicate volume level, and a "thumb" or slider to control the volume level.

Element ID	Default size (pixels)	Description
volumeButtonNormal	19 x 24	The Volume button in its active state, displayed without any indications of audio level.
volumeButtonDown	19 x 24	The Volume button in its selected state, displayed without any indications of audio level.
volumeButtonOver	19 x 24	The Volume button when the user is moving the cursor over it, displayed without any indications of audio level.
volumeButtonLowNormal	19 x 24	The Volume button in its active state, displaying an indication of a low audio level.
volumeButtonLowDown	19 x 24	The Volume button in its selected state, displaying an indication of a low audio level.
volumeButtonLowOver	19 x 24	The Volume button when the user is moving the cursor over it, displaying an indication of a low audio level.
volumeButtonMedNormal	19 x 24	The Volume button in its active state, displaying an indication of a medium audio level.
volumeButtonMedDown	19 x 24	The Volume button in its selected state, displaying an indication of a medium audio level.
volumeButtonMedOver	19 x 24	The Volume button when the user is moving the cursor over it, displaying an indication of a medium audio level.
volumeButtonHighNormal	19 x 24	The Volume button in its active state, displaying an indication of a high audio level.
volumeButtonHighDown	19 x 24	The Volume button in its selected state, displaying an indication of a high audio level.
volumeButtonHighOver	19 x 24	The Volume button when the user is moving the cursor over it, displaying an indication of a high audio level.
unmuteButtonNormal	19 x 24	The Volume button in its active state, indicating the volume is currently muted.
unmuteButtonDown	19 x 24	The Volume button in its selected state, indicating the volume is currently muted.
unmuteButtonOver	19 x 24	The Volume button when the user is moving the cursor over it, indicating the volume is currently muted.
volumeBarBackdrop	31 x 97	The vertical background for the pop-up portion of the sound control. This background is always positioned above the Volume button.
volumeBarTrack	5 x 2	The vertical track that appears when the user selects the Volume button. This track is always displayed within the volumeBarBackdrop element. The image for this element is stretched as necessary to fill the length of the track.
volumeBarTrackEnd	5 x 2	The horizontal edge of the volume bar track.
volumeBarSliderNormal	13 x 13	The “thumb” or slider that the user moves to adjust the audio level. This value refers to the slider in its active state.
volumeBarSliderDown	13 x 13	The down state indicates that the user has selected the slider, but has not released it.

Element ID	Default size (pixels)	Description
volumeBarSliderOver	13 x 13	The over state indicates that the user is moving the cursor over the slider, but has not selected it.

Next and Previous buttons

The Next and Previous buttons are used with playlists, where the player has multiple items to consecutively play. These buttons are displayed concurrently and are located between the Play/Pause button and the left edge of the scrub bar track.

Element ID	Default size (pixels)	Description
previousButtonNormal	24 x 24	The normal state indicates that there is a playlist item before that currently playing, and the user can press this button to select it.
previousButtonDown	24 x 24	The down state indicates that the user has selected this button, but has not released it.
previousButtonOver	24 x 24	The over state indicates that the user is moving the cursor over the button, but has not selected it.
previousButtonDisabled	24 x 24	This element is displayed when there is no prior track to play.
nextButtonNormal	24 x 24	The normal state indicates that there is a playlist item after that currently playing, and the user can press this button to select it.
nextButtonDown	24 x 24	The down state indicates that the user has selected this button, but has not released it.
nextButtonOver	24 x 24	The over state indicates that the user is moving the cursor over the button, but has not selected it.
nextButtonDisabled	24 x 24	This element is displayed when there is no track following the current one.

Full Screen button and HD indicator

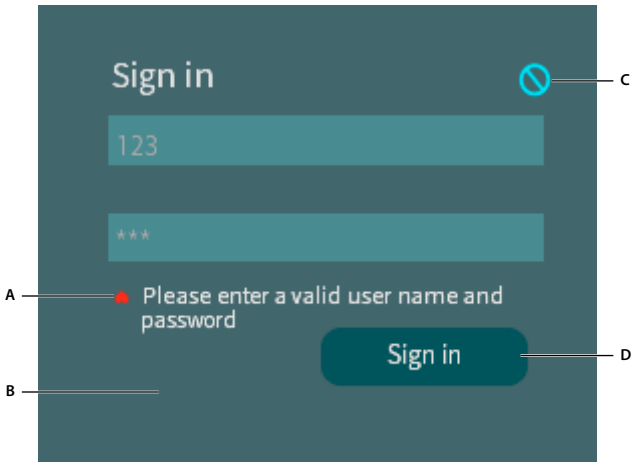
The Full Screen button allows the user to select whether to display the player window at a size covering their full computer screen. The HD indicator is not a user-selectable control; it indicates only whether high-definition (HD) content is currently playing. Both the Full Screen and HD elements are displayed on the right side of the player control bar.

Element ID	Default size (pixels)	Description
fullScreenEnterButtonNormal	20 x 24	The control the user selects to display the player window at a size that covers their full computer screen. This control is typically only displayed when the window is at less than full-screen size. The normal state indicates the control is active and selectable.
fullScreenEnterButtonDown	20 x 24	The down state indicates the user has selected the Full Screen control, but has not released it.
fullScreenEnterButtonOver	20 x 24	The over state indicates the user is moving the cursor over the Full Screen control, but has not selected it.

Element ID	Default size (pixels)	Description
fullScreenLeaveButtonNormal	20 x 24	The control the user selects to display the player window at a size less than their full computer screen. This control is typically only displayed when the window is already at full-screen size. The normal state indicates the control is active and selectable.
fullScreenLeaveButtonDown	20 x 24	The down state indicates the user has selected the control, but has not released it.
fullScreenLeaveButtonOver	20 x 24	The over state indicates the user is moving the cursor over the control, but has not selected it.
hdOn	21 x 24	This element indicates that high-definition content is currently playing.
hdOff	21 x 24	This element indicates that high-definition content is not currently playing.

Authorization dialog

Both players display an authorization dialog when a user attempts to play content you have protected with Flash Access 2.0.



Authorization dialog displayed when playing protected content
***A.** Warning icon **B.** Authorization background **C.** Cancel button **D.** Submit button*

Element ID	Default size (pixels)	Description
authWarning	11 x 9	The warning icon in the authorization dialog for protected content. This image is displayed when the user supplies an invalid name or password.
authBackdrop	294 x 209	The background of the authorization dialog for protected content.
authSubmitButtonNormal	104 x 31	The Submit button in the authorization dialog for protected content. In the normal state, the button is active and available for the user to select.
authSubmitButtonDown	104 x 31	The Submit button in the authorization dialog for protected content. In the down state, the user has selected this button, but has not released it.

Element ID	Default size (pixels)	Description
authSubmitButtonOver	104 x 31	The Submit button in the authorization dialog for protected content. In the over state, the user is moving the cursor over the button, but has not selected it.
authCancelButtonNormal	12 x 12	The Cancel button in the authorization dialog for protected content. The normal state indicates that the button is active and available for the user to select.
authCancelButtonDown	12 x 12	The Cancel button in the authorization dialog for protected content. The down state indicates that the user has selected this button, but has not released it.
authCancelButtonOver	12 x 12	The Cancel button in the authorization dialog for protected content. The over state indicates that the user is moving the cursor over the button, but has not selected it.

Overlays

Both players use the following overlay images to provide additional information to the user.

Element ID	Default size (pixels)	Description
timeHint	65 x 43	This element displays the current playback time. It is displayed as floating over the scrub bar, located at a position 35 pixels over the bottom of the control bar.
playButtonOverlayNormal	116 x 107	The player has an optional setting that displays a large Play button overlaying the middle of the screen, prior to the start of playback. The normal state for this button indicates that the user may start playback.
playButtonOverlayDown	116 x 107	The down state indicates that the user has selected the Play button overlay, but has not released it.
playButtonOverlayOver	116 x 107	The over state indicates that the user is moving the cursor over the Play button overlay, but has not selected it.
bufferingOverlay	124 x 54	This value specifies an image to use to indicate that the player is paused while filling its buffer.

Using HTML or XML to specify interface elements

The final step in applying your custom skin is to tell the player where to find the bitmaps to use. Specify on your web page what you are replacing and the location of the image that is to replace it.

You can do this in two ways. One is to set a FlashVar `skin` variable in the page's HTML code. The `skin` variable must contain the path of the skin file. The other way is to use a `skin` attribute with the player's XML configuration file. Either way, within the files you provide an element tag for each part of the interface you are changing.

Each element tag must have an `id` attribute and a `src` attribute. The `id` attribute identifies the bitmap from the default skin to replace. The `src` attribute specifies the location (either relative to the player SWF file or an absolute path) of the custom bitmap to use.

Absolute versus relative src paths

If you are specifying new interface elements, many of which **do not** share the same base path, it can make sense to use full URLs ("absolute" references) for each.

```
<skin>
    <element id="hdOn" src="http://www.myserver.com/myImages/hdOn.png"/>
    <element id="hdOff" src="http://www.myserver.com/myImages/hdOff.png"/>
    <element id="timeHint" src="http://www.webserver.com/sharedImages/timeHint.png"/
</skin>
```

However, if you have many elements that **do** share the same base path, there is a way to use partial URLs ("relative" references) for each. To do this, you use an `elements` tag to group the elements that share a base path. For the elements group, the shared path is specified by a `basePath` attribute. When set, all the `element` tags within the group get the `basePath` value prefixed to their `src` attribute:

```
<skin>
    <elements basePath="http://www.myserver.com/images/">
        <element id="hdOn" src="hdOn.png"/>
        <element id="hdOff" src="hdOff.png"/>
        <element id="timeHint" src="timeHint.png"/
    </elements>
</skin>
```

If you have several elements that do share a base path and several that do not, you can combine these methods. You can create an `elements` group and use relative paths for the ones that do share a base path. For the ones that do not, you must leave them outside the `elements` tag and specify their locations with absolute paths.

Note that the value for `basePath` is prefixed to the `element` tag values **without** adding any additional characters. For example, if `basePath` is `www.myserver.com/images` and an `elementsrc` value is `timeHint.png`, the resulting path is read as `www.myserver.com/imagestimeHint.png`, which is unlikely to be what you want.

Therefore, when using `basePath` for a folder, you must provide a URL that ends in a trailing "/". For example, `www.myserver.com/images/` would combine with `timeHint.png` to provide a result that accurately reflects the filename and directory structure.

Chapter 4: Using Plug-ins

A modern media player does much more than play media. It may also use a content delivery network (CDN), present advertising, capture user events to report to an analytics server, and so on. But the media player does not usually handle this work by itself. This additional functionality is typically provided in conjunction with third-party software known as "plug-ins."

A plug-in is nothing more than code that you invite to work with your player. When you load a plug-in, you give it permission to provide additional functionality for your player. Plug-ins are not given unlimited access to your media player. Flash Media Playback and Strobe Media Playback use Open Source Media Framework as a broker between the media player and your plug-in. This approach ensures that communication between the media player and the plug-in is both secure and standardized, making it simple to add, update, or switch plug-ins.

Your job is to load the plug-in by inserting a small amount of code in the HTML source for your web page.

Loading plug-ins

Just as you use FlashVars to customize your player's features or appearance, you also use them to load plug-ins. Specifically, you provide the location and any metadata for the plug-in within the FlashVars parameter.

You need some basic information from the plug-in's developer to begin:

1. A URL giving the location of the plug-in.
2. Whether a namespace or any other metadata is required for the plug-in to run. Note that plug-in metadata is specified in properties preceded by the plug-in's name and the underline character "_".

The bolded parts of this sample show plug-in specific values. These values include the location of the plug-in to load and metadata to provide the plug-in.

```
<object classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000"
codebase="http://download.macromedia.com/pub/shockwave/cabs/flash/swflash.cab#version=10,0,0
,0"
width="470" height="320">
    <param name="movie"
        value="http://www.myserver.com/strobe/StrobeMediaPlayback.swf"></param>
    <param name="flashvars" value="src=http://www.myserver.com/movie.flv&
        plugin_myPlugin1=http://www.mysite.com/plugins/myPlugin1.swf&
        myPlugin1_namespace=http://www.mysite.com/namespace/1.0&
        myPlugin1_retryLive=true&myPlugin1_retryInterval=10">></param>
    <param name="allowFullScreen" value="true"></param>
    <param name="allowscriptaccess" value="always"></param>
    <embed src="http://www.myserver.com/strobe/StrobeMediaPlayback.swf"
        type="application/x-shockwave-flash"
        allowscriptaccess="always" allowfullscreen="true"
        width="470" height="320"
        flashvars="src=http://www.myserver.com/mymovie.flv&
            plugin_myPlugin1=http://www.mysite.com/plugins/myPlugin1.swf&
            myPlugin1_namespace=http://www.mysite.com/namespace/1.0&
            myPlugin1_retryLive=true&myPlugin1_retryInterval=10">
    </embed>
</object>
```

Plug-in rules:

- The name of the plug-in cannot be “plugin”.
- The separator between the plug-in name and the property name is the underline character “_”.
- **The plug-in name (and any namespace alias) must follow this regular expression:** `/[a-zA-Z][0-9a-zA-Z]*/.` That is, the first character of the name can only be a lowercase (a-z) or uppercase (A-Z) letter from the English alphabet. Characters after the first can be lowercase or uppercase English letters or the digits 0-9. For example, names cannot contain the special separator underline character “_”.
- Only the plug-in URL is validated. The remaining parameters are not validated, but are passed unchanged to the plug-in. The plug-in itself is responsible for examining the other values.
- All parameter names are case-sensitive.
- A plug-in namespace parameter is optional. If you do not specify one, the player can create a namespace if one is needed.

For more information on plug-ins, including sample plug-ins, a development guide, and links to plug-ins developed by third parties, see www.osmf.org and opensource.adobe.com