Microsoft® Smooth Streaming Plugin for Open Source Media Framework

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Contents

Overview 2

Smooth Streaming plugin for OSMF 2.0 2

Loading Plugin 3

SS for OSMF static loading 3

SS for OSMF dynamic loading 5

Strobe Media Playback with SS for OSMF dynamic plugin 8

Overview

The Microsoft® Smooth Streaming plugin for Open Source Media Framework 2.0 (SS for OSMF) extends the default capabilities of OSMF and adds Microsoft® Smooth Streaming content playback to new and existing OSMF players. The plugin also adds Smooth Streaming playback capabilities to Strobe Media Playback (SMP).

Beginning with version MSAdaptiveStreamingPlugin-v1.0.9-beta-osmf2.0, the plugin includes preview (beta) version of Windows Azure Media Services video on-demand MPEG-DASH playback support. The support is in beta state and plugin only supports Windows Azure Media Services MPEG-DASH output.

To enable Windows Azure Media Services MPEG-DASH support, please follow the direction on Dynamic Packaging configuration page. After enabling Dynamic Packaging feature basically you should add **"/Manifest(format=mpd-time-csf)"** extension at the end of your Smooth Streaming published URLS. (Note: This feature is still in preview state and the format and support might change in future.)

SS for OSMF includes two versions of the plugin:

- Static Smooth Streaming plugin for OSMF (.swc)
- Dynamic Smooth Streaming plugin for OSMF (.swf)

This document assumes that you have a general knowledge of OSMF and OSMF plugins. For more information and details, please see the documentations on the official OSMF site.

Smooth Streaming plugin for OSMF 2.0

The plugin supports loading and playback of on-demand Smooth Streaming and Windows Azure Media Services MPEG-DASH content with the following features:

- On-demand Smooth Streaming/MPEG-DASH playback (Play, Pause, Seek, Stop)
- Live Smooth Streaming and DVR playback (Play, Pause, Seek, DVR, Go-to-live)

- Support for video codecs – H.264
- Support for Audio codecs – AAC
- Multiple audio language switching with OSMF built-in APIs
- Max playback quality selection with OSMF built-in APIs
- Adobe® Flash® Player 10.2 or higher.
- This version only supports OSMF 2.0

The following are unsupported features:

- VC-1 and WMA codec
- Content protection (PlayReady)
- Text and Sparse Tracks
- Trickplay (slow motion, fast-forward, and rewind)
- MPEG-DASH Live streaming

The following is a list of known issues:

- Multiple Smooth Streaming content playback on single page might cause issues. This is a known issue with OSMF.
- Playback of Stage video might cause problems and no video on some machines. As a workaround you can disable hardware acceleration or Stage video.

Loading Plugin

OSMF plugins can be loaded statically (at compile time) or dynamically (at run-time). Smooth Streaming plugin for OSMF includes both dynamic and static versions.

- Static loading: To load statically, a static library (SWC) file is required. Static plugins are added as a reference to the projects and merge inside the final output file at the compile time.
- Dynamic loading: To load dynamically, a precompiled (SWF) file is required. Dynamic plugins are loaded in the runtime and not included in the project output. (Compiled output) Dynamic plugins can be loaded using HTTP and FILE protocols.

For more information on static and dynamic loading, see the official OSMF plugin page here.

SS for OSMF static loading

The code snippet below shows how to load SS plugin for OSMF statically and play a basic video using the OSMF MediaFactory class. Before including the SS for OSMF code, please ensure that the project reference includes the “MSAdaptiveStreamingPlugin-v1.0.9-beta-osmf2.0.swc” static plugin.

```
package
{

        import com.microsoft.azure.media.AdaptiveStreamingPluginInfo;

        import flash.display.*;
        import org.osmf.media.*;
        import org.osmf.containers.MediaContainer;
        import org.osmf.events.MediaErrorEvent;
        import org.osmf.events.MediaFactoryEvent;
        import org.osmf.events.MediaPlayerStateChangeEvent;
        import org.osmf.layout.*;



        [SWF(width="1024", height="768", backgroundColor='#405050', frameRate="25")]
        public class TestPlayer extends Sprite
        {
                public var _container:MediaContainer;
                public var _mediaFactory:DefaultMediaFactory;
                private var _mediaPlayerSprite:MediaPlayerSprite;


                public function TestPlayer( )
                {
                        stage.quality = StageQuality.HIGH;

                        initMediaPlayer();

                }

                private function initMediaPlayer():void
                {

                        // Create the container (sprite) for managing display and layout
                        _mediaPlayerSprite = new MediaPlayerSprite();
                        _mediaPlayerSprite.addEventListener(MediaErrorEvent.MEDIA_ERROR,
onPlayerFailed);

        _mediaPlayerSprite.addEventListener(MediaPlayerStateChangeEvent.MEDIA_PLAYER_STATE_CHANGE
, onPlayerStateChange);
                        _mediaPlayerSprite.scaleMode = ScaleMode.NONE;
                        _mediaPlayerSprite.width = stage.stageWidth;
                        _mediaPlayerSprite.height = stage.stageHeight;
                        //Adds the container to the stage
                        addChild(_mediaPlayerSprite);

                        // Create a mediafactory instance
                        _mediaFactory = new DefaultMediaFactory();

                        // Add the listeners for PLUGIN_LOADING

        _mediaFactory.addEventListener(MediaFactoryEvent.PLUGIN_LOAD,onPluginLoaded);
                        _mediaFactory.addEventListener(MediaFactoryEvent.PLUGIN_LOAD_ERROR,
onPluginLoadFailed );

                        // Load the plugin class
                        loadAdaptiveStreamingPlugin( );

                }

                private function loadAdaptiveStreamingPlugin( ):void
                {
                        var pluginResource:MediaResourceBase;

                        pluginResource = new PluginInfoResource(new AdaptiveStreamingPluginInfo(
));

                        _mediaFactory.loadPlugin( pluginResource );
                }

                private function onPluginLoaded( event:MediaFactoryEvent ):void
                {
                        // The plugin is loaded successfully.
                // Your web server needs to host a valid crossdomain.xml file to allow plugin to
        download Smooth Streaming files.
        // For Windows Azure Media Services MPEG-DASH sample
        loadMediaSource("http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_ste
el_1080p.ism/Manifest(format=mpd-time-csf)")
// For Smooth Streaming
// loadMediaSource("http://devplatem.vo.msecnd.net/Sintel/Sintel_H264.ism/manifest")


                }

                private function onPluginLoadFailed( event:MediaFactoryEvent ):void
                {
                        // The plugin is failed to load ...
                }


                private function onPlayerStateChange(event:MediaPlayerStateChangeEvent) : void
                {
                        var state:String;

                        state =  event.state;

                        switch (state)
                        {
                                case MediaPlayerState.LOADING:

                                        // A new source is started to load.

                                        break;

                                case  MediaPlayerState.READY :
                                        // Add code to deal with Player Ready when it is hit the
first load after a source is loaded.

                                        break;

                                case MediaPlayerState.BUFFERING :

                                        break;

                                case  MediaPlayerState.PAUSED :
                                        break;
                                // other states ...
                        }
                }

                private function onPlayerFailed(event:MediaErrorEvent) : void
                {
                        // Media Player is failed .
                }

                private function loadMediaSource(sourceURL : String):void
                {
                        // Take an URL of SmoothStreamingSource’s manifest and add it to the page.

                        var resource:URLResource= new URLResource( sourceURL );

                        var element:MediaElement = _mediaFactory.createMediaElement( resource );
                        _mediaPlayerSprite.scaleMode = ScaleMode.LETTERBOX;
                        _mediaPlayerSprite.width = stage.stageWidth;
                        _mediaPlayerSprite.height = stage.stageHeight;

                        // Add the media element
                        _mediaPlayerSprite.media = element;
                }

        }
}
```

SS for OSMF dynamic loading

The code snippet below shows how to load SS plugin for OSMF dynamically and play a basic video using the OSMF MediaFactory class. Before including the SS for OSMF code, copy the

“MSAdaptiveStreamingPlugin-v1.0.9-beta-osmf2.0.swf” dynamic plugin to the project folder if you want to load using FILE protocol, or copy under a web server for HTTP load. There is no need to include “MSAdaptiveStreamingPlugin-v1.0.9-beta-osmf2.0.swc” in the project references.

```
package
{

        import flash.display.*;
        import org.osmf.media.*;
        import org.osmf.containers.MediaContainer;
        import org.osmf.events.MediaErrorEvent;
        import org.osmf.events.MediaFactoryEvent;
        import org.osmf.events.MediaPlayerStateChangeEvent;
        import org.osmf.layout.*;
        import flash.events.Event;
        import flash.system.Capabilities;


        //Sets the size of the SWF

        [SWF(width="1024", height="768", backgroundColor='#405050', frameRate="25")]
        public class TestPlayer extends Sprite
        {
                public var _container:MediaContainer;
                public var _mediaFactory:DefaultMediaFactory;
                private var _mediaPlayerSprite:MediaPlayerSprite;


                public function TestPlayer( )
                {
                        stage.quality = StageQuality.HIGH;
                        initMediaPlayer();
                }

                private function initMediaPlayer():void
                {

                        // Create the container (sprite) for managing display and layout
                        _mediaPlayerSprite = new MediaPlayerSprite();
                        _mediaPlayerSprite.addEventListener(MediaErrorEvent.MEDIA_ERROR,
onPlayerFailed);

        _mediaPlayerSprite.addEventListener(MediaPlayerStateChangeEvent.MEDIA_PLAYER_STATE_CHANGE
, onPlayerStateChange);

                        //Adds the container to the stage
                        addChild(_mediaPlayerSprite);

                        // Create a mediafactory instance
                        _mediaFactory = new DefaultMediaFactory();

                        // Add the listeners for PLUGIN_LOADING

        _mediaFactory.addEventListener(MediaFactoryEvent.PLUGIN_LOAD,onPluginLoaded);
                        _mediaFactory.addEventListener(MediaFactoryEvent.PLUGIN_LOAD_ERROR,
onPluginLoadFailed );

                        // Load the plugin class
                        loadAdaptiveStreamingPlugin( );

                }

                private function loadAdaptiveStreamingPlugin( ):void
                {
                        var pluginResource:MediaResourceBase;
                        var adaptiveStreamingPluginUrl:String;
                // Your dynamic plugin web server needs to host a valid crossdomain.xml file to
        allow loading plugins.
```

```
                        adaptiveStreamingPluginUrl = "http://yourdomain/MSAdaptiveStreamingPlugin-
v1.0.9-beta-osmf2.0.swf";

                        pluginResource = new URLResource(adaptiveStreamingPluginUrl);
                        _mediaFactory.loadPlugin( pluginResource );

                }

                private function onPluginLoaded( event:MediaFactoryEvent ):void
                {
                        // The plugin is loaded successfully.

        // Your web server needs to host a valid crossdomain.xml file to allow plugin to download
        Smooth Streaming files.
// For Windows Azure Media Services MPEG-DASH sample
        loadMediaSource("http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_ste
el_1080p.ism/Manifest(format=mpd-time-csf)")

// For Smooth Streaming
        // loadMediaSource("http://devplatem.vo.msecnd.net/Sintel/Sintel_H264.ism/manifest")


        }

                private function onPluginLoadFailed( event:MediaFactoryEvent ):void
                {
                        // The plugin is failed to load ...
                }


                private function onPlayerStateChange(event:MediaPlayerStateChangeEvent) : void
                {
                        var state:String;

                        state =  event.state;

                        switch (state)
                        {
                                case MediaPlayerState.LOADING:

                                        // A new source is started to load.

                                        break;

                                case  MediaPlayerState.READY :
                                        // Add code to deal with Player Ready when it is hit the
first load after a source is loaded.

                                        break;

                                case MediaPlayerState.BUFFERING :

                                        break;

                                case  MediaPlayerState.PAUSED :
                                        break;
                                // other states ...
                        }
                }

                private function onPlayerFailed(event:MediaErrorEvent) : void
                {
                        // Media Player is failed .
                }

                private function loadMediaSource(sourceURL : String):void
                {
                        // Take an URL of SmoothStreamingSource’s manifest and add it to the page.

                        var resource:URLResource= new URLResource( sourceURL );
```

```
                      var element:MediaElement = _mediaFactory.createMediaElement( resource );
                      _mediaPlayerSprite.scaleMode = ScaleMode.LETTERBOX;
                      _mediaPlayerSprite.width = stage.stageWidth;
                      _mediaPlayerSprite.height = stage.stageHeight;
                      // Add the media element
                      _mediaPlayerSprite.media = element;
               }

       }
}
```

Strobe Media Playback with SS for OSMF dynamic plugin

The Smooth Streaming for OSMF dynamic plugin is compatible with Strobe Media Playback (SMP). You can use SS for OSMF plugin to add Smooth Streaming content playback to SMP. To do this, copy “MSAdaptiveStreamingPlugin-v1.0.9-beta-osmf2.0.swf” under a web server for HTTP load using the following steps:

1. Browse Strobe Media Playback setup page. (http://osmf.org/dev/2.0gm/setup.html)
2. Set the src to a Smooth Streaming source, (e.g. for Smooth Streaming http://devplatem.vo.msecnd.net/Sintel/Sintel_H264.ism/manifest for Windows Azure Media Services MPEG-DASH http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_steel_1080p.ism/Manifest(format=mpd-time-csf))
3. Make the desired configuration changes and click **Preview and Update**.
   Note: Your content web server needs a valid crossdomain.xml.
4. Copy the preview code and paste the code to a simple HTML page using your favorite text editor, such as in the following example:

```
<html>
<body>
<object width="920" height="640">
<param name="movie" value="http://osmf.org/dev/2.0gm/StrobeMediaPlayback.swf"></param>
<param name="flashvars"
value="src=http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_steel_1080p.ism/Manifest(f
ormat=mpd-time-csf)&autoPlay=true"></param>
<param name="allowFullScreen" value="true"></param>
<param name="allowscriptaccess" value="always"></param>
<param name="wmode" value="direct"></param>
<embed src="http://osmf.org/dev/2.0gm/StrobeMediaPlayback.swf"
    type="application/x-shockwave-flash"
    allowscriptaccess="always"
    allowfullscreen="true"
    wmode="direct"
    width="920"
    height="640"
    flashvars="src=http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_steel_1080p.ism/Ma
nifest(format=mpd-time-csf)&autoPlay=true"></embed>
</object>
</body>
</html>
```

5. Add Smooth Streaming OSMF plugin to the embedded code and save.

```
<html>
<object width="920" height="640">
<param name="movie" value="http://osmf.org/dev/2.0gm/StrobeMediaPlayback.swf"></param>
<param name="flashvars"
value="src=http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_steel_1080p.ism/Manifest(f
ormat=mpd-time-
csf)&autoPlay=true&plugin_AdaptiveStreamingPlugin=http://yourdomain/MSAdaptiveStreamingPlugin-v1.0.9-beta-
osmf2.0.swf&AdaptiveStreamingPlugin_retryLive=true&AdaptiveStreamingPlugin_retryInterval=10"></param>

<param name="allowFullScreen" value="true"></param>
<param name="allowscriptaccess" value="always"></param>
<param name="wmode" value="direct"></param>
<embed src="http://osmf.org/dev/2.0gm/StrobeMediaPlayback.swf"
    type="application/x-shockwave-flash"
    allowscriptaccess="always"
    allowfullscreen="true"
    wmode="direct"
    width="920"
    height="640"
    flashvars="src=http://wams.edgesuite.net/media/Tears_of_Steel_Smooth_1080p/tears_of_steel_1080p.ism/Ma
nifest(format=mpd-time-
csf)&autoPlay=true&plugin_AdaptiveStreamingPlugin=http://yourdomain/MSAdaptiveStreamingPlugin-v1.0.9-beta-
osmf2.0.swf&AdaptiveStreamingPlugin_retryLive=true&AdaptiveStreamingPlugin_retryInterval=10"></embed>

</object>
</html>
```

6. Save your HTML page and publish to a web server. Browse to the published web page using your favorite Flash® Player enabled Internet browser (IE, Chrome, Firefox, so on).
7. Enjoy Smooth Streaming content inside Adobe® Flash® Player.

For more information on general OSMF development, please see official OSMF development page.