RENDERHEADS

AVPro QuickTime

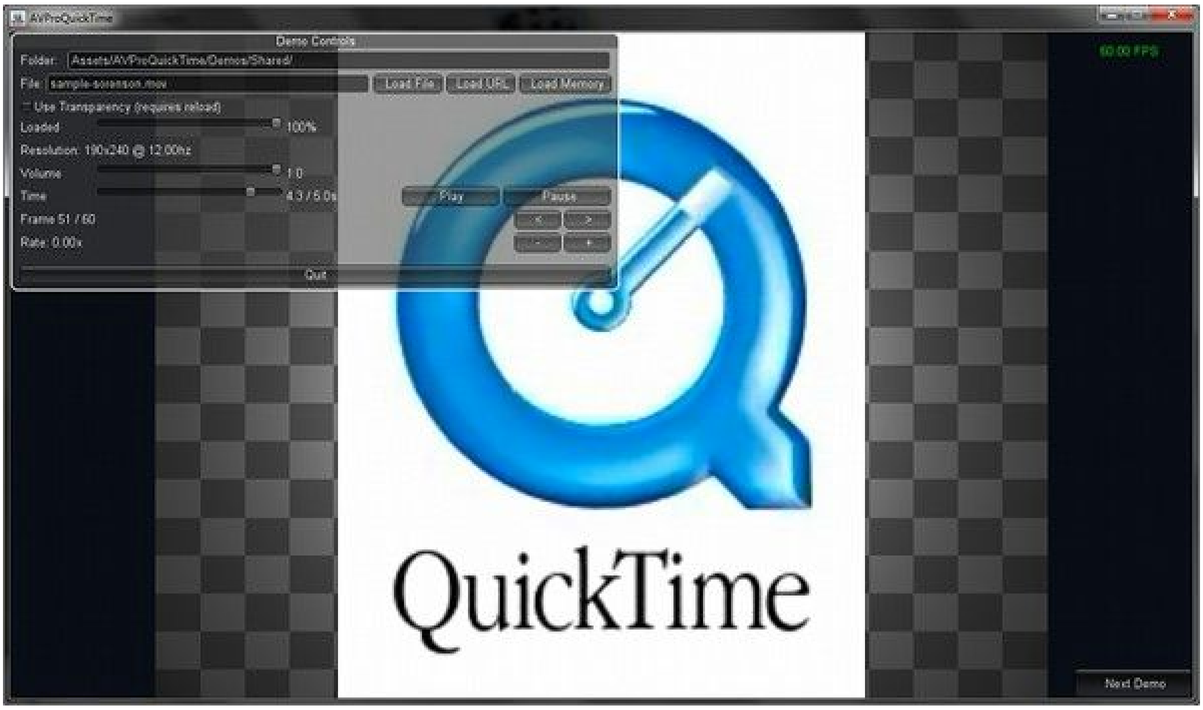
Unity plugin for fast playback of HD video and audio content

Version 3.10

Released 18 April 2016

Contents

1. Introduction



Folder: Assets/AVProQuickTime/Demos/Shared/

File: sample-sorenson.mov

□ Use Transparency (requires reload)

Loaded 100%

Resolution: 190x240 @ 12.00hz

Volume 1.0

Time 4.3 / 5.0s

Frame 51 / 60

Rate: 0.00x

AVPro QuickTime™ is a plugin for Unity that allows playback of supported QuickTime content in a fast and easy manner.

The plugin is aimed at the high-end user group that require video playback features beyond Unity's built-in video support.

We see this plugin being useful in the following areas:

- Interactive Installations
- Serious Games
- Kiosks
- Video Apps

QuickTime is a trademark of Apple Inc., registered in the U.S. and other countries.

2. System Requirements

Microsoft Windows:

- Desktop Microsoft Windows platform
- QuickTime 7.7.6 installed on the system
- Unity Pro 4.1 - 4.6
- Unity Pro 5.0 - 5.4 (32-bit editor only)
- QuickTime Hap codec installed for Hap support

Mac OSX:

- Desktop Mac OSX platform
- Unity Pro 4.1 - 4.6
- QuickTime Hap codec installed for Hap support

NOTE: This Unity plugin will soon be retired and unsupported. Please take a look at our new video playback plugin called AVPro Video.

NOTE: 64-bit isn’t supported by QuickTime so you cannot make 64-bit builds or use a 64-bit version of the Unity editor.

NOTE: Apple no longer accept applications submitted to their app store that use the QuickTime API. If you plan to submit your application to the Apple App Store then do not use this plugin.

2.1 Platforms not Supported

- WebGL
- WebPlayer
- Mobile, Android, iOS, Windows Phone
- Linux
- Blackberry, Flash, Consoles

*** Oculus Rift: Not officially supported (yet), but feel free to test it for yourself with the trial version. We have heard from people that have successfully used it.*

3. Installation

1. Import the **unitypackage** file into your Unity project.

2. Move the DLL plugin files to the appropriate folder:

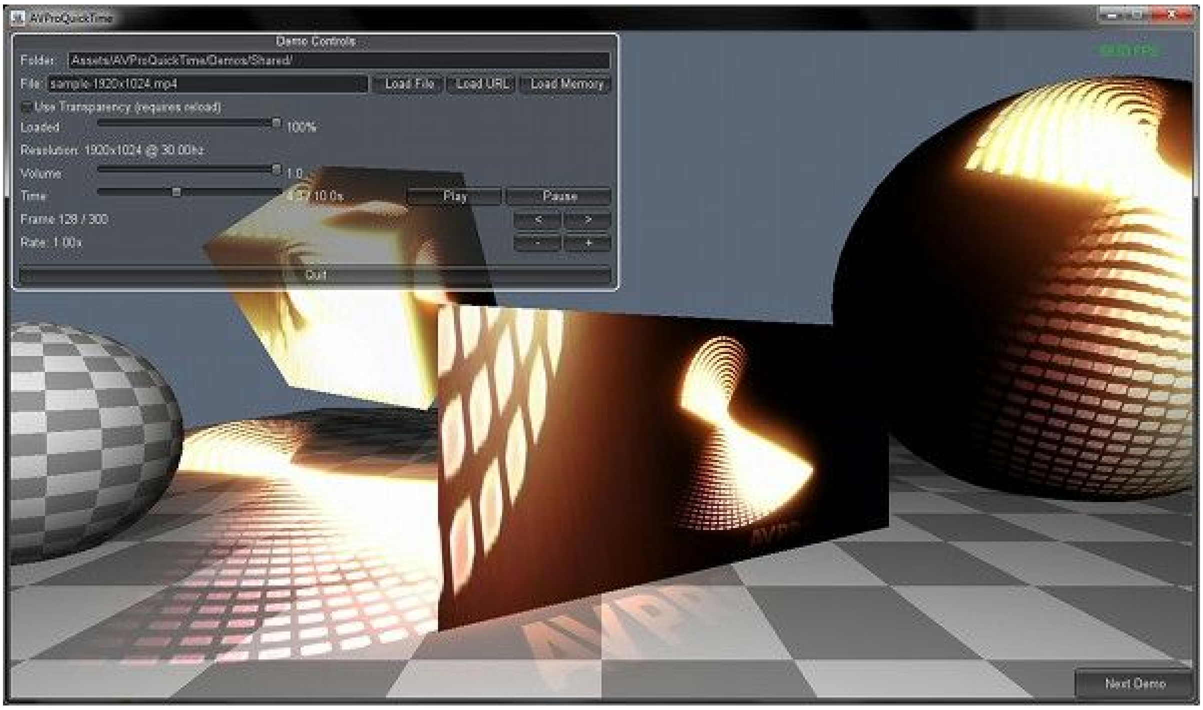
   a. In Unity version 4.x move the **Assets/AVProWindowsMedia/Plugins** folder to **Assets/Plugins**.

   b. In Unity version 5.x the above can be done, or the plugin inspector can be used.

3. Ensure you have the relevant **codecs installed** for the content you want to play.

4. For Windows users: make sure QuickTime is installed on your system

4. Features



Folder: Assets/AVProQuickTime/Demos/Shared/

File: sample-1920x1024.mp4

□ Use Transparency (requires reload)

Loaded 100%

Resolution: 1920x1024 @ 30.00hz

Volume 1.0

Time 4.27 / 10.0s

Frame 128 / 300

Rate: 1.00x

- Unity 4.1 - 5.4 supported (5.x not supported on Mac due to 32-bit requirement).
- Free watermarked trial version available.
- Years of professional use in the field.
- Fast native Direct3D9, Direct3D11 and OpenGL texture updates.
- Frame accurate seeking and scrubbing.
- Supports video transparency.
- Hap codec support.
- Play videos from disk or from memory.
- Unity 4.6 uGUI support.
- NGUI support.

4.1 General

- Play multiple QuickTime videos (or audio) simultaneously.
- Audio volume control.
- Frame by frame playback.
- Seeking.
- Playback rate control, including reverse.

- Playback from memory allows loading from a byte[] array.
- Streaming from URL

4.2 Unity Integration

The "AVPro QuickTime" plugin provides an API for playing QuickTime content. Additionally some helpful Unity components have been created to allow drag and drop use of the plugin without any scripting. See the "Unity Components" section below.

Movies are uploaded to standard Unity Texture2D objects.

4.3 Alpha / Transparent Video Support

The plugin supports video codecs that support an alpha channel, allowing playback of transparent videos - something that Unity's native Ogg Theora codec doesn't allow.

Codecs with alpha channel support include:

1. QuickTime native Animation
2. QuickTime native JPEG-2000
3. QuickTime native PNG
4. Resolume DXV (http://www.resolume.com/software/dxv.php)
5. Hap (http://vdmx.vidvox.net/blog/hap)

There codecs also support alpha but they are generally too slow to use for real-time:

1. Apple ProRes4444 http://en.wikipedia.org/wiki/ProRes_422
2. DNxHD Codec
   http://en.wikipedia.org/wiki/DNxHD_codec
   http://www.avid.com/US/industries/workflow/DNxHD-Codec

4.4 Advanced File Loading & Streaming

The plugin supports loading files from:

1. Local file system

   Loading content dynamically from disk allows content to be replaced and updated without relying on having Unity installed. This is especially useful when creating an application that must be maintained/updated by a third party, or for live applications where content is being created while the application is running.

Another benefit of loading dynamically instead of importing into Unity is the time it takes to import assets. If you have a lot of video content, importing the assets can take a very long time. In this case, loading them dynamically provides a much better workflow.

2. Memory

   Loading from memory allows you to hide your movie content from users. One way to do this is to use Unity's TextAsset loader. The data can then be loaded from a byte[] array.

3. URL (beta)

   Loading from URL allows videos to be streamed. When streaming videos it's important to have them encoded correctly using the "Internet Fast Start" option and a suitable bit-rate. QuickTime encoder has an option to enable "Fast Start", as does the FFMPEG command-line tool. URLs can have the prefix "http://" for files hosted on a web server and "file:///" for local files. FFMPEG can be used to add "Fast Start" to an MP4 file via this command:

   ```
   ffmpeg.exe -i "input.mp4" -c:v libx264 -tune fastdecode -g 12 -crf: 25 -pix_fmt yuv420p -movflags +faststart "output.mp4"
   ```

4.5 Video Codec Choice

Video codecs can be chosen to suit the content and playback requirements. Typical requirements:

- Lossless / HQ encoding

  Codecs like PNG and ProRes allow for perfect or near-perfect video encoding.

- Transparency

  See the list of codecs supporting transparency above.

- File size

  Codecs like H.264 give great file size reduction, however not everyone is worried about file size and can choose another codec that is more suited.

- Fast scrubbing / seeking

  Codecs without inter-frame dependencies allow for fast seeking and scrubbing. Typical codecs are: DV, Motion JPEG, PNG, ProRes

- CPU usage

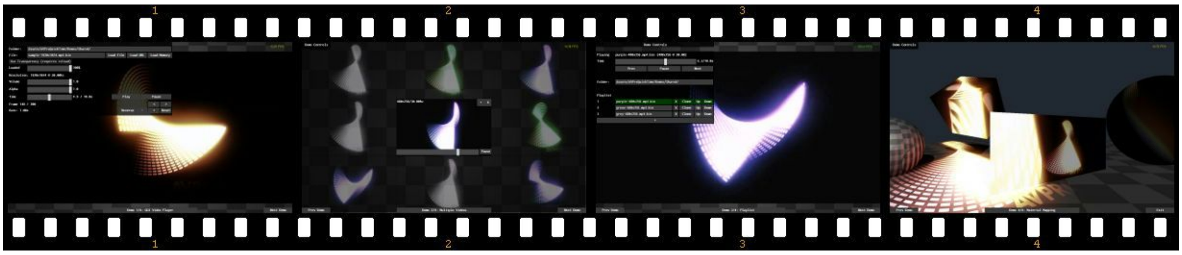
  Some codecs (like H.264) use a lot of CPU during decoding. Other codecs can be used (usually at the expense of disk space) to allow for less CPU usage. XVid is generally provides a good balance of CPU usage and file size.

4.6 Audio & Video Formats

Playback of most of the file formats that QuickTime supports. Including:

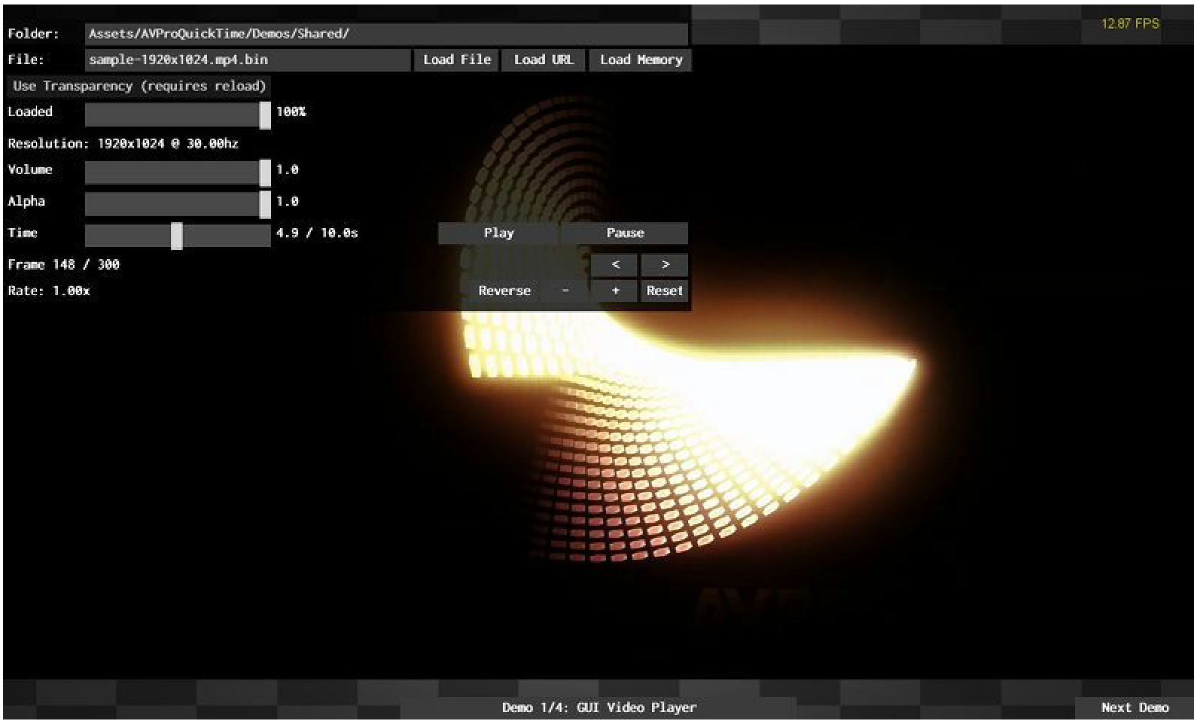
Video / Codecs	Image	Audio
QuickTime Movie (mov)	JPEG	MP3
MPEG4 (mp4)	PNG	AAC
Animated GIF (gif)	BMP	WAV (uncompressed)
H.264	JPEG 2000	AU
DV	TGA	MIDI
Microsoft AVI (limited)	TIFF	Apple Lossless
Motion JPEG	GIF	AIFF
Hap / Hap Alpha / Hap Q		
3GP & 3G2		
Animation		

5.0 Demos



The package comes with 5 demo scenes to get you started.

5.1 GUI Video Player Demo



Folder: Assets/AVProQuickTime/Demos/Shared/

File: sample-1920x1024.mp4.bin

Loaded 100%

Resolution: 1920x1024 @ 30.00hz

Volume 1.0

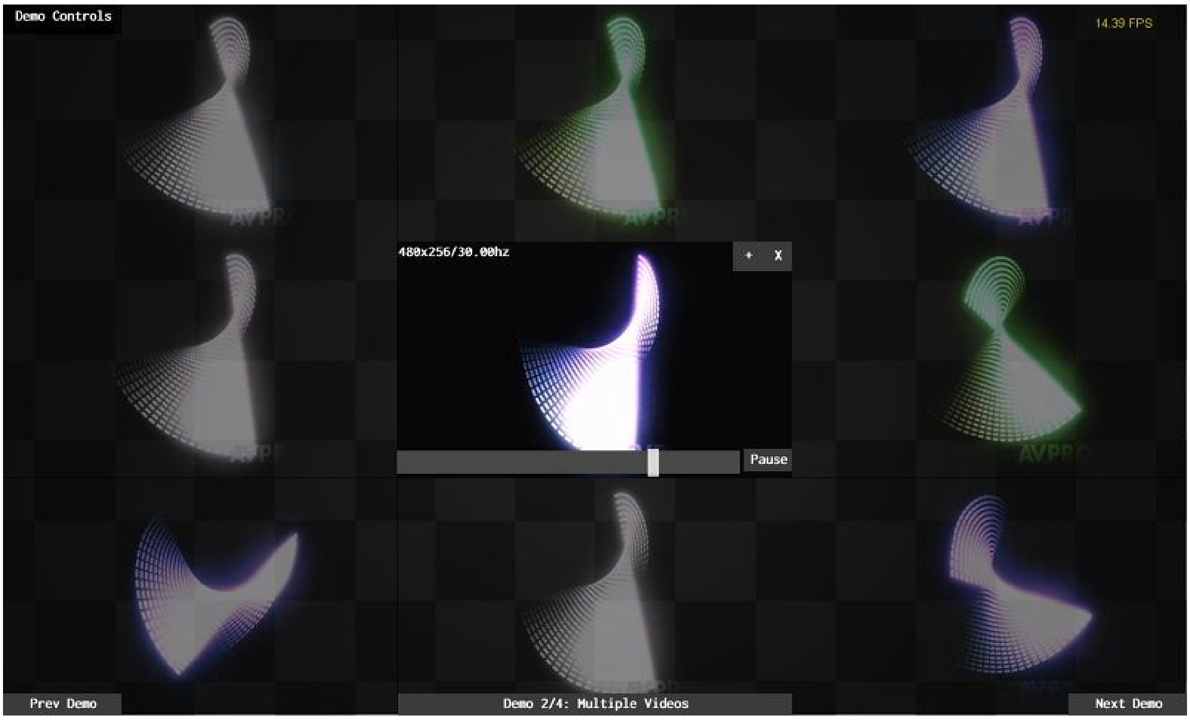
Alpha 1.0

Time 4.9 / 10.0s

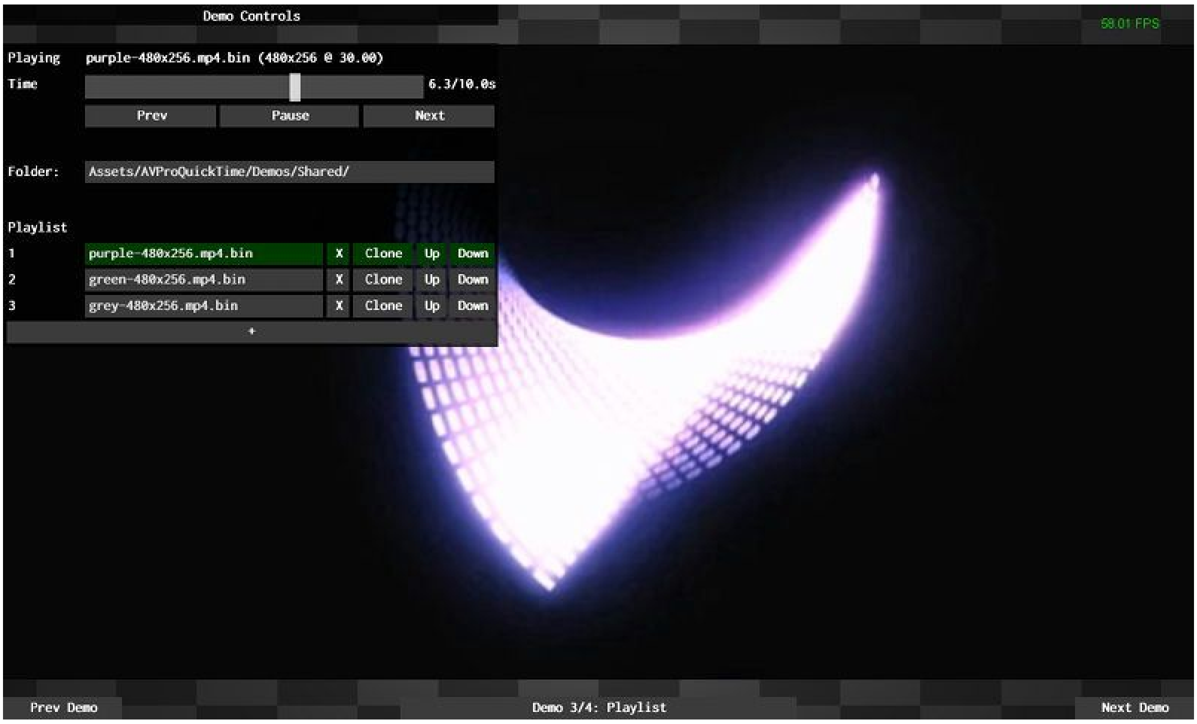
Frame 148 / 300

Rate: 1.00x

5.2 Multiple Videos Demo



5.3 Playlist Demo



Playing purple-480x256.mp4.bin (480x256 @ 30.00)

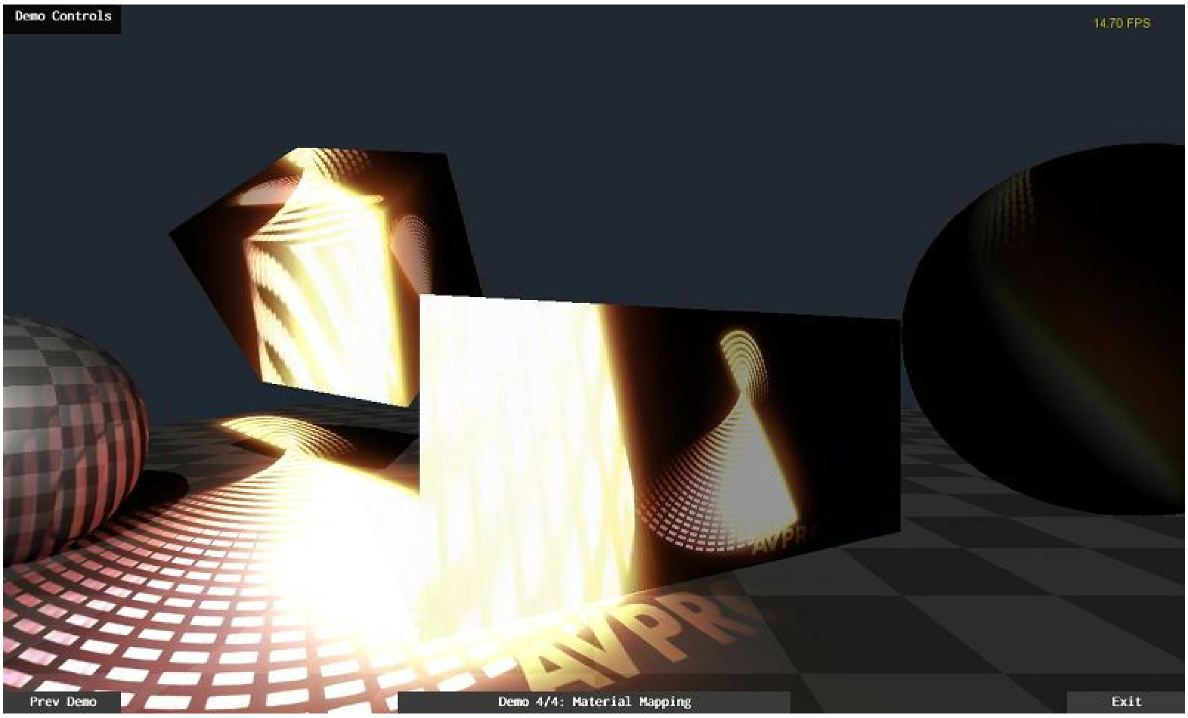
Time 6.3/10.0s

Folder: Assets/AVProQuickTime/Demos/Shared/

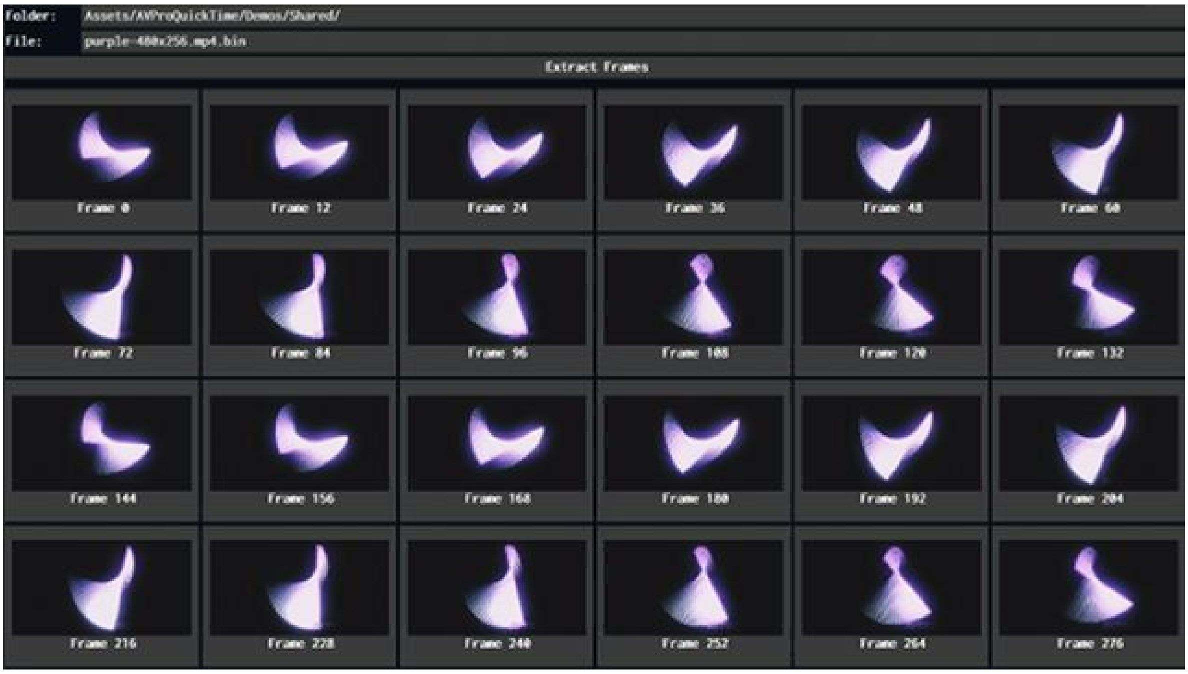
Playlist

1	purple-480x256.mp4.bin	X	Clone	Up	Down
2	green-480x256.mp4.bin	X	Clone	Up	Down
3	grey-480x256.mp4.bin	X	Clone	Up	Down

5.4 Material Mapping Demo

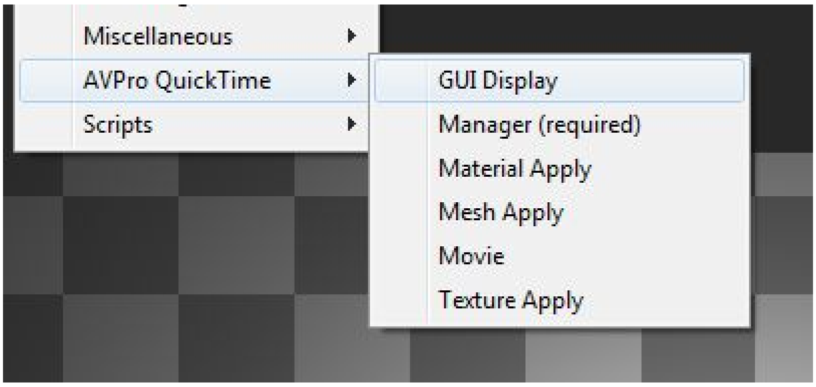


5.5 Frame Extract Demo


Folder: Assets/AVProQuickTime/Demos/Shared/

File: purple-480x256.mp4.bin

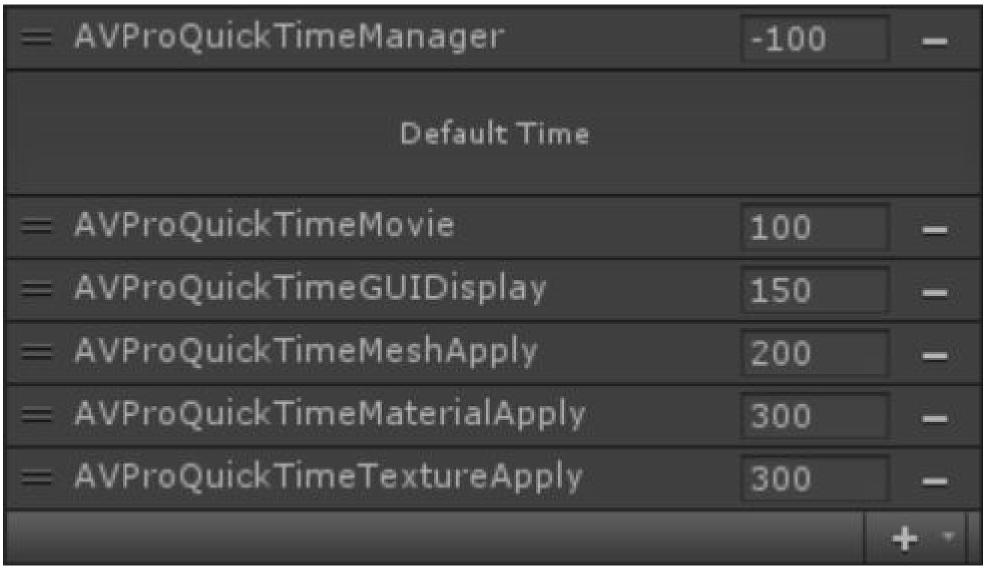
6. Unity Components



This asset includes a number of Unity script components that allow use of the asset without any scripting.

6.0 Script Order

Sometimes the script execution order is important and we recommend this order for our component scripts:



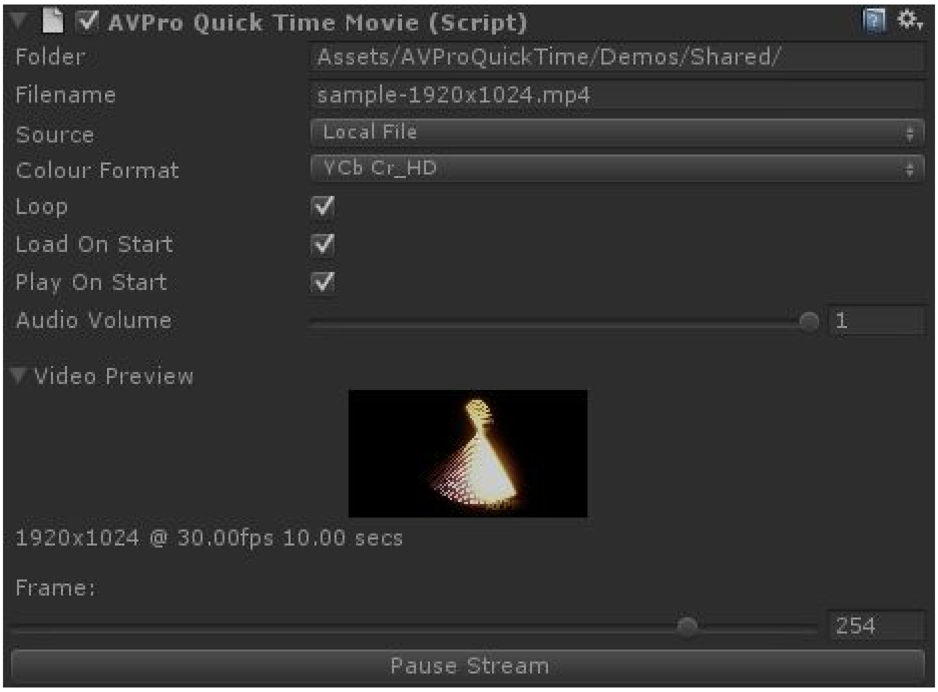
AVProQuickTimeManager	-100
Default Time	
AVProQuickTimeMovie	100
AVProQuickTimeGUIDisplay	150
AVProQuickTimeMeshApply	200
AVProQuickTimeMaterialApply	300
AVProQuickTimeTextureApply	300

The most important is the Manager script which should always be one of the first in your list. Any of our own scripts that refer to the AVPro QuickTime scripts may have to have their script order explicitly set so they run after the AVPro QuickTime scripts.

6.1 AVProQuickTimeManager

There must always be exactly one **AVProQuickTimeManager** in your scene when you use this plugin. It is also important that this component starts before the other **AVProQuickTimeMovie** components (controllable via Script Execution Order setting). There is nothing to configure in this component.

6.2 AVProQuickTimeMovie



☑ AVPro Quick Time Movie (Script)

Folder	Assets/AVProQuickTime/Demos/Shared/
Filename	sample-1920x1024.mp4
Source	Local File
Colour Format	YCb Cr_HD
Loop	☑
Load On Start	☑
Play On Start	☑
Audio Volume	1

Video Preview

1920x1024 @ 30.00fps 10.00 secs

Frame: 254

This component represents a single piece of media (video or audio) that can be loaded and played. The colour format is the internal format that is used to play the video and can affect quality and performance. the options are:

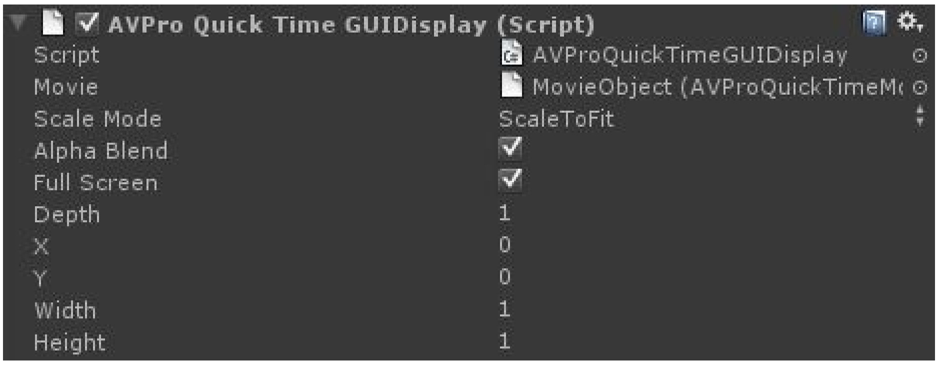
- “YCbCr_HD” (default): Fast playback using the Rec. 709 YUV colour conversion.
- “YCbCr_SD”: Fast playback using the Rec.601 YUV colour conversion.
- “RGBA32”: This mode is slower but it allows for videos with alpha channel.

The colour format cannot be changed once the video is playing.

When the editor is playing additional controls are displayed showing you the contents of the video which is useful during development. Note that having the video preview visible can affect frame rate as it forces update of the Unity UI.

This component simply plays the movie and doesn’t display it on the screen. For display take a look at the components below.

6.3 AVProQuickTimeGUIDisplay



☑ AVPro Quick Time GUIDisplay (Script)

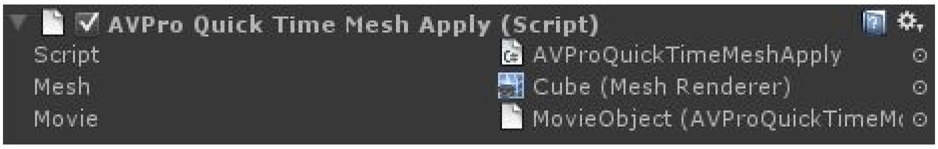
Script	AVProQuickTimeGUIDisplay
Movie	MovieObject (AVProQuickTimeM(
Scale Mode	ScaleToFit
Alpha Blend	☑
Full Screen	☑
Depth	1
X	0
Y	0
Width	1
Height	1

This component displays an AVProQuickTimeMovie on the screen using Unity's IMGUI system. Simply select the **AVProQuickTimeMovie** component you want to display in the "Movie" option. Next you can set the placement of the item on the screen or use the fullscreen default.

6.4 AVProQuickTimeUGUIComponent

This component displays an AVProQuickTimeMovie on the screen using the new uGUI system introduced in Unity 4.6. Simply select the **AVProQuickTimeMovie** component you want to display in the "Movie" option.

6.6 AVProQuickTimeMeshApply

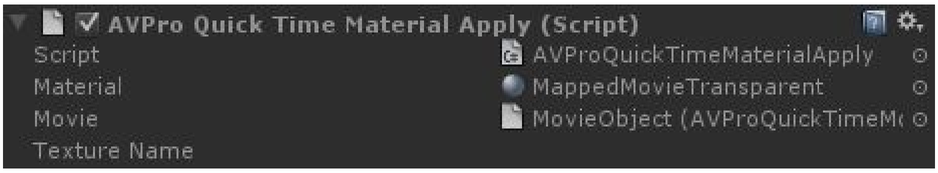


☑ AVPro Quick Time Mesh Apply (Script)

Script	AVProQuickTimeMeshApply
Mesh	Cube (Mesh Renderer)
Movie	MovieObject (AVProQuickTimeM(

Use this component to apply an **AVProQuickTimeMovie** to all of the materials used by a mesh in your scene.

6.6 AVProQuickTimeMaterialApply



☑ AVPro Quick Time Material Apply (Script)

Script	AVProQuickTimeMaterialApply
Material	MappedMovieTransparent
Movie	MovieObject (AVProQuickTimeM(
Texture Name	

Use this component to apply an **AVProQuickTimeMovie** to a material in your scene. Optionally a texture name can be specified to override a specific texture slot in the material.

7. Playback Performance

7.1 Hardware

The first thing to check is your hardware to make sure it's suitable. You'll need a decent GPU and CPU with the specifications related to the resolution of video you're trying to play back and also the settings used during the encoding of the video. Use the Task Manager and Resource Monitor to help determine if there is too much load being placed on any one part of the system (HDD, CPU, GPU etc).

If the video file is very large or the video is a high frame rate then your hard drive speed could also be an issue. You should find out how many MB/s your drive can read and work out how many MB/s your video requires for playback (by using file size in MB / frames per second). For large videos (especially Uncompressed or Hap encoded videos) an SSD drive is recommended.

We have also had reports that systems with multiple GPUs (eg AMD CrossFire / NVidia SLI) can have jerky playback issues due to a phenomena known as micro-stutters. Currently we don't recommend such configurations for completely smooth playback.

7.2 Video Format

You should use the best suited video format for your intended use. Some codecs are great for compression, others are tuned for speed and most have many encoding options you can tweak to suit your needs.

If you don't mind using large videos then the Hap video codec is probably your best choice. Hap encoded videos use minimal CPU to decode and are compressed in a format that is suitable for direct upload to the GPU.

H.264 is usually one of the most CPU intensive codecs H.264 videos (commonly in a .mov or .mp4 container) are often highly compressed and this can make them slower to play back. The H.264 encoder has many many options that can be used to tune how the videos are compressed and how they play. It is important when encoding videos to select the best options for playback. One handy tool we use is FFMPEG. FFMPEG can be used to convert videos for faster playback with the following command-line:

```
ffmpeg -i input.mp4 -c:v libx264 -pix_fmt yuv420p -preset veryslow -tune fastdecode
-profile:v main -coder 0 -g 6 -crf 20 output.mp4
```

or even more aggressive:

```
ffmpeg -i input.mp4 -c:v libx264 -pix_fmt yuv420p -preset veryslow -tune fastdecode
-profile:v main -crf 20 -refs 1 -coder 0 -g 30 -x264opts no-deblock -x264opts bframes=0
output.mp4
```

The H.263 compatible XVid/DivX formats offer a good balance between speed, file size and quality.

7.3 Codec Tuning

Some codecs are configurable and can be tuned for better playback.

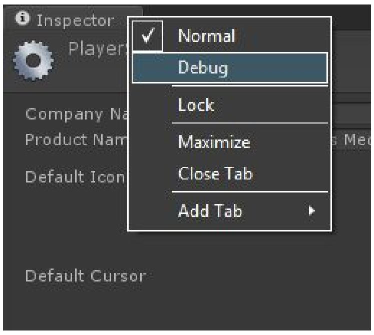
7.4 Video Resolution

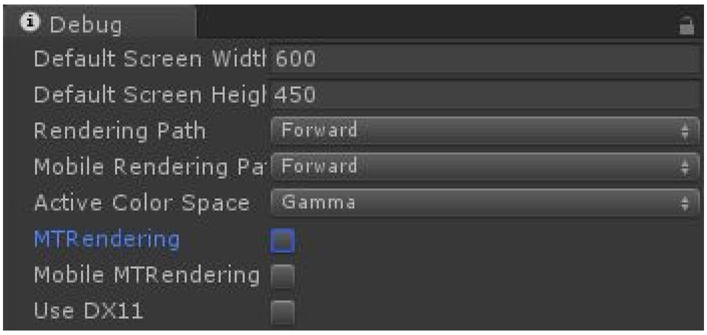
This is a minor point, but selecting the right resolution can impact on performance due to memory alignment for GPU texture updates. In order of preference:

1. Video width and height are both power-of-2 size (eg 256, 512, 1024, 2048, 4096).
2. Video width is power-of-2, height is any value.
3. Video width and height are multiples of 16 (perfectly divisible by 16).
4. Video width is a multiple of 16, height is any value.
5. Video width and height are a multiple of 4.
6. Video width is a multiple of 4, height is any value.
7. Video width and height are any value.

7.5 Multi-Threading

If your video plays smoothly in the editor but is jerky when you make a build then disabling Unity's multi-threaded rendering can help. Go to Player Settings, switch the Inspector to Debug disable and disable "MT Rendering":




Debug
Default Screen Widtl 600
Default Screen Heigl 450
Rendering Path Forward
Mobile Rendering Pa Forward
Active Color Space Gamma
MTRendering □
Mobile MTRendering □
Use DX11 □

7.6 Display Frame-Rate Sync

Videos should be authored at a frame-rate that is a multiple of the device used to display them. For example a 30fps video can display smoothly on a 60hz monitor, but a 24fps video will not.

7.7 Machine Setup

For best results the machine should have minimal background processes running as these can all affect application performance.

7.8 Garbage Collection

Garbage collection can cause a frame drop. Make sure your application isn't generating too much garbage, or follow Unity's guide for preparing the garbage heap so you can control collection better.

7.9 Latest version

You should also check the Asset Store to make sure you're using the latest version of this plugin, and using the latest supported version of Unity.

*If you have questions about your file formats etc you can contact us with your questions.

8. Support

If you are in need of support or have any comments/suggestions regarding this product please contact us.

Website: http://www.renderheads.com/contact/
Forum: http://forum.unity3d.com/threads/142416-Released-AVPro-QuickTime
Email: unitysupport@renderheads.com

8.1 Bug Reporting

If you are reporting a bug, please include any relevant files and details so that we may remedy the problem as fast as possible:

- Details of the video file you're having problems with
    - Resolution
    - Codec
    - Frame rate
- Better still, include a link to the video file.
- The console/output log if relevant
- The version of Unity you are using.
- The version of AVPro QuickTime plugin you are using.
- The version of Windows you are using.

9. About RenderHeads Ltd

RenderHeads Ltd is an award winning creative and technical company that has been designing and building cutting edge technology solutions since its formation in 2006. We specialise in creating unique interactive audio-visual software for installations at auto shows, museums, shows and expos.

9.1 Services

- Unity plugin development
- Unity game / interaction / augmented reality development
- Unity consulting

9.2 Our Unity Plugins

[AVPro QuickTime]

[AVPro Windows Media]

[AVPro Movie Capture]

[AVPro Live Camera]

Appendix A - FAQ (Frequently Asked Questions)

A1.1 Installation

1. **How do I fix the error: “DLLNotFoundException”?**

   You need to move/copy the “Plugins” folder from your “AVProQuickTime” folder into the root of your folder structure. This means the “Plugins” folder should be moved to your “Assets” folder.

   If you are trying to make a 64-bit build you will also get this error message as the plugin doesn’t support 64-bit builds.

2. **How do I make a 64-bit build?**

   The plugin doesn’t support 64-bit builds.

A1.2 Deployment

1. **Creating a standalone build on the Mac fails to load my movies, what’s wrong?**

   It seems QuickTime and .Net (used by Load from Memory) look for files in different places by default. QuickTime searches relative to the actual .app folder package and .Net searches relative to the folder the .app is in. To load from disk you need to place your files INSIDE the .app content package. Or prefix “../” to your path prefix to access folders at the same level as your application.

A1.3 Scripting

1. **I keep getting “`System.IO.File' does not contain a definition for `ReadAllBytes'” or similar missing .NET function messages, how can I fix them?**

   This usually happens when your project is set to build a Web Player or another platform that doesn’t support certain .NET features. You need to go to File->Build Settings and change the platform to “PC and Mac Standalone”.

2. **I have compiled the scripts into a DLL and am now experiencing some unexpected behaviour.**

   Some of our scripts have Unity version-specific preprocessor defines which determine how they compile (eg UNITY_4_0). Usually when you build an external DLL these defines are missing and so the incorrect version of the code can be compiled. You need to add the appropriate compiler defines to your build.

A1.4 Codecs

1. **How do I play back HAP encoded videos?**

   Playback of HAP videos requires Unity 5.x or Unity 4.x or Unity 3.5 (OpenGL mode ONLY). In the AVProQuickTimeMovie component disable “Allow YUV”.

A1.5 Playback / Performance

1. **My movie appears too bright or desaturated, how can I fix it?**

   Use the “YCbCr_HD” colour format instead of “YCbCr_SD”, this will force the plugin to use a different colour conversion routine that is more suitable for your movie.

2. **My H.264 encoded video doesn’t play smoothly,, how can I make it play smoother?**

   See playback performance section of this document.

3. **Video playback is jerky on high-end GPU system, how can I fix it?**

   If you have a top-end GPU setup there could be micro-stutter issues. We don’t recommend using multiple GPU configurations (eg AMD CrossFire / NVidia SLI) with our plugin.

A1.6 Other

1. **Streaming from a URL isn’t working?**

   Officially this feature is still in beta and we have had mixed results during our testing. Some people have reported that tweaking QuickTime can improve things. There are some notes here: http://www.wowza.com/forums/content.php?63-How-to-configure-Apple-QuickTime-player-for-RTSP-RTP-playback-on-Windows

2. **Which Unity video-playback plugin is better:
   AVPro Windows Media or AVPro QuickTime?**

   If you need easy cross-platform (PC-Mac) video support then AVPro QuickTime is the only way to go. It is possible to use both plugins together and get the best of both worlds but this would require some scripting to create a basic wrapper to encapsulate both plugins.

   If you are focusing on Windows PC only and need high performance then we recommend using AVPro Windows Media as we have found QuickTime support on PC to be lacking (especially in multi-threaded video codec performance) since the

QuickTime engine for PC hasn't been updated in some time.

QuickTime though can be easier as it only requires a single install whereas on the PC you need to know what codecs you need to support and potential install multiple codecs.

You can contact us with your requirements if you're not sure. We also have downloadable demos on the website which you can use for testing. Here is a table to help you decide:

	AVPro QuickTime	**AVPro Windows Media**
Windows PC Support	Yes	Yes
Mac Support	Yes	No
64-bit support	No	Yes
Scrubbing Support	Very Fast (codec dependent)	Fast (codec dependent)
Great performance playing multiple HD videos on Windows PC	No	Yes
Requires additional installs	Only on Windows PC - you must install the QuickTime player	Only if you want to support codecs that Windows doesn't natively expose to DirectShow
ProRes Codec	Yes	No
MP4 container support	Supported	Must install a codec

Appendix B - Version History

- **Version X - Possible future features/enhancements**
  - Add 3D movie support?
  - Streaming meta data support (artist / song title)?
  - QuickTime VR support?
  - Improve code documentation?
  - Add mip-map generation support?
  - Add audio pitch control?
  - Make demo of videos starting in sync?
  - Audio plays into Unity to support 3D sound?
  - Look at performance bug when UI is hidden
  - Unity 5.1.2 bug where 2 videos applied to 2 materials, one is unloaded = crash
  - ← Your suggestion here

- **Version 3.10 - 18 April 2016**
  - Fixed Unity 5.2 - 5.4 support
  - Fixed error messages when WebPlayer selected
  - Fixed uGUI error in newer Unity versions
  - Added keep aspect ratio option to uGUI component
  - Added uGUI shortcut to GameObjects/UI menu
  - Added newer Unity GL.IssuePluginEvent support
  - Fixed bug where shaders transformer weren't being run in Unity >= 5.3.0
  - Manager class is now added dynamically if missing
  - Manager class exposes option for logging on video load and using coroutine for updates
  - Manager shader loading loads from resources now
  - Sample videos now in StreamingAssets folder
  - Added option for opening videos in StreamingAssets folder
  - Better version logging

- **Version 3.04 - 3 July 2015 (Internal release)**
  - Added support for dynamic resolution changes of streaming video

- **Version 3.02 - 15 June 2015**
  - Fixed Unity 5.1 support

- **Version 3.0 - 16 March 2015**
  - Added Unity 4.6 and 5.0 support
  - Added 'ignore flips' options to boost performance in some circumstances
  - Improved editor preview with ability to view alpha channel
  - Updated minimum version to Unity 4.1
  - Support for Unity 3.x dropped
  - Removed lots of legacy code used to support older versions of Unity

    - Improved performance of RGBA32 videos in Unity 5 DX11 due to not having to swap red-blue channels
    - Improved preview with alpha channel view
    - Improved manager with overview of all videos
    - Trial watermark performance improvements
    - Improved documentation

- **Version 2.92 - 12 May 2014**
    - Added relative frame stepping
    - Added function to detect whether QuickTime is installed
    - Improved variable frame-rate video support
    - Optimised pixel format conversion

- **Version 2.90 - 3 May 2014**
    - Fixed support for odd width videos
    - Fixed Unity 3.x opengl texture update bug
    - Fixed multi-thread crash when closing videos
    - Fixed texture release leak in editor
    - Added DiscardContent before writing to rendertexture
    - Added names to textures
    - Fixed watermark drawing logic for padded videos

- **Version 2.88 - 31 March 2014**
    - Improved performance through native DirectX texture support
    - Add audio balance support
    - Improved editor display
    - Added end of movie notification
    - Improved streaming support (still beta)
    - Improved looping
    - Added installer script to auto copy the DLLs
    - Using aligned memory buffers now

- **Version 2.8 - 12 September 2013**
    - Added support for all 3 high-speed Hap video codecs
    - Added automatic transparency detection
    - Simplified colour format selection
    - Added Unity 4.2 and Unity 4.3 support
    - Added Unity 4.1 non-pow2 texture support - optimisation
    - Added new demo that plays multiple videos simultaneously
    - Added new demo that extracts video frames
    - Added Script Order to documentation
    - Fixed alt-tab issue
    - Fixed some issues with streaming radio
    - Fixed issue with releasing video handles

- **Version 2.5.2 - 18 March 2013**
    - Unity 4.1 support added
    - Fixed a few platform #if issues

- **Version 2.5 - 11 March 2013**
    - Added a new demo that plays a queue of videos
    - Improved AVProQuickTimeManager
    - Optimised and improved pixel format conversion
    - Added dynamic setting of loop state.
    - Added path resolve for relative paths when working path isn’t that of the EXE
    - Fixed GL.IssuePluginEvents() conflict bug with other AVPro plugins.
    - Fixed Apple App Store submission issues
    - Fixed small memory leak when playing movies from memory.
    - Fixed several bugs

- **Version 2.4 - 20 December 2012**
    - Unity 4.0 support including native DirectX texture updates
    - Improved streaming from URL.
    - Improved performance.
    - Removed overlay mode rendering

- **Version 2.2 - Friday 28 September 2012**
    - Added overlay rendering mode.
    - Improved performance.
    - Improved handling of seeking, frame stepping.
    - Added FPS display in inspector for each movie.
    - Texture no longer updates when video has completed playing.
    - Added option to load the first frame of the video.
    - Fixed bug that caused ProRes codec to crash on exit.
    - Fixed volume slider bug.

- **Version 2.0 - Tuesday 17 July 2012**
    - UTF-8 support added.
    - Easier components for non-scripter.
    - Components have unique names.
    - Improved memory cleanup.
    - Added in-editor preview of videos.
    - Improved demo scenes.
    - Fixed a bug in OpenGL alpha videos.

- **Version 1.9.4 - Monday 18 June 2012**
    - Fixed a bug in GetFrameCount()

- **Version 1.9.2 - Wednesday 3 May 2012**
    - Fixed texture update bug in OpenGL with Unity3.5.

    - Added support for BT709 conversion.

- **Version 1.9 - Friday 17 February 2012**
    - Plugin now also built for Mac.
    - Playback from memory.
    - Playback from URL (beta).
    - Better performance switching between videos of the same resolution.
    - Fixed a resource leak.

- **Version 1.8 - Wednesday 18 January 2012**
    - Fixed a memory leak.

- **Version 1.7 - Wednesday 11 January 2012**
    - Added playback rate control, including reverse.

- **Version 1.5 - Thursday 22 December 2011**
    - Improved stability.
    - Tidied up demos.

- **Version 1.4 - Tuesday 30 November 2011**
    - Added frame-by-frame playback.
    - Updated logo graphics.
    - Added FPS counter to benchmark demo.

- **Version 1.2 - Thursday 17 November 2001**
    - Accepted at Asset Store.
    - Fixed seeking bug.
    - Fixed OpenGL state bug.
    - Improved demo controls.

- **Version 1.0 - Wednesday 26 October 2011**
    - Initial release submitted to Asset Store.