



VERSION 8.0.1.XXX - DEVELOPED BY: AVOLITES MEDIA LTD. POWERED BY: SALVATION (TM)
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GREG, ADAM, OLIE, ALL AT AVOLITES AND YOU. SPECIAL THANKS MARK CALVERT. LETS ROCK!

System Optimisation

VERSION 8.X

By Arran Rothwell-Eyre December 2014

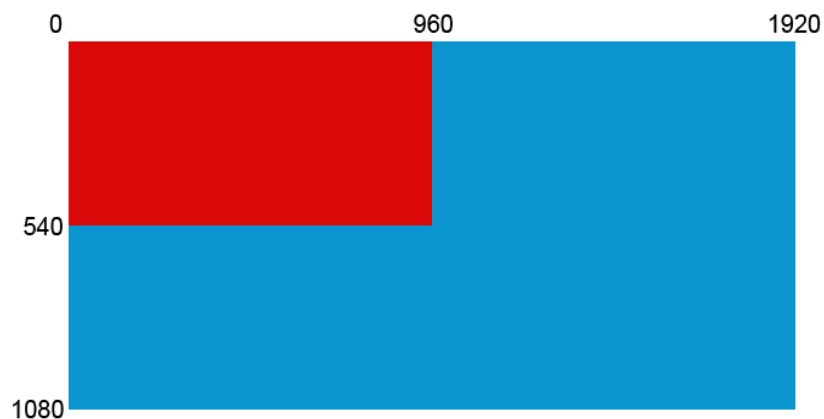
with Additions by Dave Green & Ciaran Abrams

System Optimisation

When building a show in Ai, it can help to have an understanding of some of the ways to optimise your project and use your computer to maximise the performance of both and how these changes can affect performance.

Resolution

In the following picture, we can see an image of 960 x 540 has a total of 518,400 pixels whereas an image with twice the width and height has 2,073,600 pixels – this equates to 4 times as much work for the computer to do.



An images quality cannot be increased by playing it back at a higher resolution (it will need to be re-encoded from source) so playing back media at a higher resolution than its rendered size is not of benefit to the video, all it will do is increase the size of the pixels within the video.

Media Storage

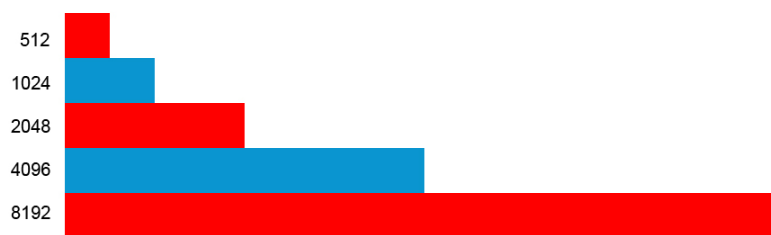


Storing your media on a separate drive to the one which your operating system is installed on will greatly reduce the time needed to read or write your media files to and from the drive. In the case of windows, it regularly writes to a system file stored on the primary hard drive whilst its in use. If this happens whilst trying to read or write a media file, the potential bandwidth is potentially halved as twice as many read / write operations need to be carried out on that drive at that moment in time.

Texture memory / canvas size

when an area of computer memory is used for computer graphics, the size of the area reserved in memory is always rounded up to the nearest multiple of 2. With lower resolutions, the impact is minimal, but when dealing with higher resolutions, this can substantially increase the required system performance for your show. For instance, an image with a width of 4090 pixels falls within the 4096 buffer size, whereas an image with a width of 5000 pixels would need to be calculated in the next sized buffer – one of 8192 – those extra 10 pixels have effectively doubled the required workload. With this in mind, some sensibly thought out UV mapping of your model can reduce the processing requirements of your machine considerably.

The following image gives a visual indication of the increase in size of progressively larger texture memory buffers.



GPU accelerated playback

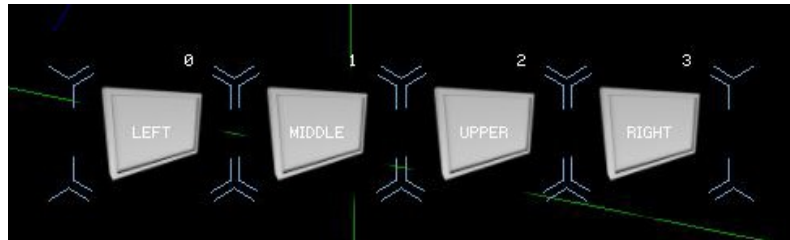
Whilst Ai supports playback of many standard codecs, the best performance will be given by codecs which support hardware acceleration on the GPU such as AiM and DXV. In the case of these 2 formats, the graphics processor is used to boost processing and share the load of decoding, rather than relying purely on the CPU as is the case with codecs such as PhotoJPEG or Animation codec. The benefit to this is that generally a graphics card is able to carry out more simultaneous calculations than a CPU due to a large amount of Pixel Pipelines compared to the number of cores found on a Processor and also leaves the CPU to do other important system tasks.

Suitable codecs

In an ideal world, everything you playback in the Ai software will be encoded in AiM format. If you do need to make use of a codec which isn't GPU accelerated, there are still some considerations to be made to ensure optimal performance and control. Ideally, the less compression the better as any decompressing will need to be done on the fly and therefore increases system strain. It is also worth noting that some formats such as MPEG based codecs can be less suited to live manipulation due to the way the frames are compressed and stored, this in turn increases the system load when manipulating them live.

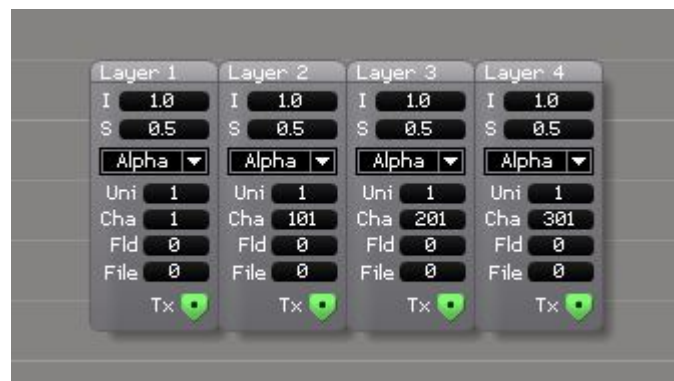
Fixture load

As well as the power required for each layer in your project, there is a certain amount of processing overhead involved in the running of a fixture. For this reason it may be possible to decrease system load by reducing the amount of fixtures within the project and increase the amount of layers on the remaining fixtures and then use pan and zoom on the layer to ensure that specific media ends up in its required position on your outputs. It is also worth noting that any 3d transformation or rotation applied to layers will also increase the load on the fixture as the graphics system needs to process a 3dimensional area instead of a 2 dimensional space.



Amount of layers

The amount of layers in use can have an impact on system performance, especially when multiplied across several fixtures. Ai allows you to fade on the layer which can greatly reduce your need for complicated multi layer setups. Unnecessary layers can be easily removed from a project by going into the mixer for the relevant fixture and deleting the chosen layer.



Multiple Graphics cards

when using multiple graphics cards it is important that they are correctly synchronised. In the case of the Fire Pro series which feature in Ai servers, we use the S400 sync card, which can be accessed via Catalyst Control Centre. When cards are not correctly synchronised to a master, they can reduce system performance , destabilise the playback timing of media across multiple video outputs and lead to a low playback rate.

Software and Drivers

Upto date drivers can be very important for good graphics performance, so keep an eye on your manufacturers website unless a specific driver is required. The drivers supplied with Ai servers have been optimised for use with Ai, so they are always the best ones to use. Its always worth checking the latest version of Ai as we regularly introducing program optimisations, the latest version can be always be found on the download page in the support section of www.avolitesmedia.com