BUILD 8K WORKFLOWS POWERED BY NVIDIA

Andrew Page

Post production is embracing 8K - enjoying the benefits of the extra pixels but also facing some challenges with the workflow. NVIDIA's Andrew Page, Product Manager for Professional Visualization Solutions, sits down with postPerspective to discuss the progress of 8K and how NVIDIA is involved.

HOW NVIDIA GPUs ENABLE 8K WORKFLOWS

The naysayers might say, "8K, already? Why?" But the world continues to evolve, and so does technology. Post-production apps are already embracing 8K, including Premiere Pro, SGO Mistika, Autodesk Flame, and Blackmagic DaVinci Resolve, and NVIDIA GPUs are helping to power these workflows.

Camera manufacturers such as RED and Sony are already there, and it's not just for 2D work. Those working in VR/360 have access to 8K via GoPros and other 360-degree camera rigs.

postPerspective News Extra recently reached out to Andrew Page, Product Manager, Professional Visualization at NVIDIA, to find out more about the progress of 8K and how NVIDIA is involved.

Why would someone want to work with 8K?

Of all the possible reasons, the least likely one right now is that you're going to show your work in 8K resolution. While YouTube and a few other distribution systems offer the ability to distribute 8K, the available options for 8K displays are extremely limited. This will change, of course, and as the demand for 8K displays grows, so will the options for streaming it. When 4K came out, a lot of people thought it would be decades before it was in common use, but in the era of streaming video, the market is moving much faster than it did in the past. Nearly 75% of large screen televisions sold last year were 4K, and the Consumer Technology Association (CES) predicts that over 80 million 4K TVs will be sold this year. It's also predicted that 100% of all televisions sold next year will be 4K.

More importantly, using an 8K camera will benefit a cinematographer who's distributing their work in 4K, or even HD. The extra pixels in the sensor provide a better image when it's scaled down from 8K to 4K than most native 4K cameras would provide. Those extra pixels also let you re-frame the shot or give motion stabilization filters more information to work with, yielding better results. The extra information is also beneficial for VFX integration since it provides the artists more data to pull from to create their shots.

Dedicated 8K cameras are not the only 8K content either — a 360 video with a four-camera 4K GoPro rig or a Nokia Ozo with eight 2K cameras each produce an 8K image. So when working with 360 video, 8K is a common video frame size.

What kind of planning is necessary before working in 8K?

The most important piece to plan for is making sure your tools and infrastructure can handle the larger frame size that an 8K image provides. 8K is four times the size of 4K so you need to make sure your GPU, CPU, memory and storage are all capable of handling that increase. There are a lot of choices available today to build an 8K capable system or infrastructure.

Are people shooting in 8K even if they are creating 4K content?

Yes, it's very common for videographers to capture more than what is needed to provide greater flexibility in post production. Whether capturing higher frame rates, greater color spaces, or higher resolutions, the extra pixels available provide more creative options and improve the final image. For example, 8K video allows you to create a sharper image when downsizing or reframing to 4K. The same is true of 5K and 6K cameras, which are very common in the industry. It's also a great way to future-proof content by prepping the best quality footage for future use.

What are some of the challenges of an 8K workflow for post-production houses, and how can they address those challenges?

Similar to the transition post houses went through when they moved their capabilities from HD to stereo to 4K, the main challenge is moving files with increased size and complexity through each step of the workflow. The change is the same: 4K is four times HD, and 8K is four times 4K. Fortunately, for post houses and independents alike, the software vendors have already added support for GPUs, making the transition possible. To help post houses address the storage needs, NVIDIA partners, such as OpenDrives and Dell EMC, have storage solutions capable of the increased throughput that 8K requires. On the display side, there are not many 8K display devices available today, but over time that will change.

## With so few 8K displays on the market, what is the best way to view 8K?

You're right, there are not many 8K displays on the market. There's Dell's 34-inch display, which we have used and looks great. Sharp has announced a TV which will ship next year in Asia to start. Following the same trend that 4K TVs did, I wouldn't be surprised to see more 8K TVs introduced at the Consumer Electronics Show (CES) in January.

Most of the people I've talked with that are finishing to 8K have invested in a Dell 8K display, or work on a 4K/5K display and zoom in and out as they need based upon what they are doing.

How do you edit and post produce 8K material? What are the tools/apps needed?

There are many applications capable of dealing with 8K video today, from editorial to grading, as well as creative finishing. Great examples of this include Adobe Premiere Pro, Blackmagic's DaVinci Resolve, SGO Mistika and Autodesk Flame. Each had 8K demos on display at IBC this year. These ISVs are all capable of delivering these features because they have written CUDA, OpenCL or OpenGL into their applications to harness the power of the GPU.

8K footage comes in many codecs and formats, like Apple ProRes, Avid DNXhr, H.264, H.265, VP9 and all the camera RAW formats like RED's R3D. NVIDIA has been working with 8K video footage from a RED Weapon 8K camera in our labs and we've had great success with R3D files. We're also working with Cinegy's DANIEL2 compression. Some of our newer GPUs support GPU-accelerated decode and encode of 8K H.265 or VP9 content as well, which software vendors are starting to take advantage of.
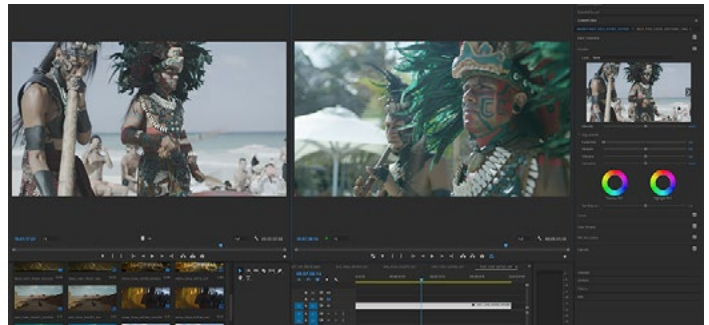
Adobe Premiere Powered by NVIDIA Quadro 8K

Quadro for Mobile Workstations

Does 8K require special hardware to edit?

Beyond a good GPU and fast storage in a capable workstation or PC, there isn't a need for anything special. The main difference between 4K and 8K is the amount of data and processing that each frame needs. Customers can choose the components that make the most sense for their needs and workflow. We recommend an NVIDIA [TITAN], Quadro P5000 or P6000, with suitably fast storage systems, such as a PCIe SSD, workstation internal SSD arrays, or Thunderbolt-connected SSD arrays.

Is an SSD attached to the GPU the only way to edit 8K?

Absolutely not. In a PC, workstation or laptop, the key requirement is storage that's fast enough to send the data to the GPU. The existing PCI connections are plenty fast to make that happen. People working in 8K today are working with laptops or workstations with NVIDIA graphics.

Is 8K only for 2D?

It's common for people to associate 8K with a flat image coming from a single high-res camera, however there are more applications for 8K video. Many 360 camera rigs can capture video that becomes 8K or even greater after stitching. These 360 videos can be used for VR-like applications, but they're also great for creating lighting and reflections for 3D scenes in general.

How is NVIDIA technology helping 8K workflows?

Software developers need to increase the throughput of their applications by four times in order to move from supporting 4K to supporting 8K. The parallel processing capabilities of a GPU allow an ISV to do this whether they choose to program to it using CUDA, OpenCL, OpenGL, DirectX or Vulkan. Some of our newer GPUs also have 8K-capable H.265 and VP9 encoders and decoders built in, which developers can integrate to provide realtime 8K encode and decode.

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