Visual Effects in the Age of the Cloud

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ABSTRACT

The Visual Effects industry is presently grappling with how to best take advantage of cloud computing, a technology which has transformed the practice of software in many industries. The ability to treat the provisioning and configuration of render farm hardware with the flexibility of software is highly attractive, but the learning curve can be challenging to juggle with busy production schedules. Fully managed web services have also taken hold in some parts of the production pipeline, with more likely to come. Software vendors creating web services need to enable studios with the right combination of security, backwards compatibility, ease of use, and programmability, so they may adopt these technologies without interrupting their Visual Effects production.

In this panel, we will discuss current usage of cloud computing in Visual Effects, how it is trending, and how it interacts with other factors like the growth of VFX-oriented open source software. Studios range in their use of render farms from full on-premises setups through hybrid setups blending their premises with the cloud to all-in cloud rendering. We will explore how fast internet connections and efficient streaming desktop technology are enabling full end-to-end production to move to the cloud with Zero Client workstations. Our panel consists of a diverse group of technologists, representing both Visual Effects studios and the creators of software for the industry.

CCS CONCEPTS

• **Computing methodologies** → **Rendering**; • **Computer systems organization** → **Cloud computing**; • **Human-centered computing** → *Open source software*;

KEYWORDS

cloud computing, visual effects, rendering, open source

1 PANEL CONVERSATION

We will engage in a conversation tying together production and software voices around the influence that the cloud and other technology trends are having on Visual Effects software and its use in production. "Cloud" represents a broad range of technologies, vendors, and techniques, which means that everyone interprets the cloud differently according to their experience and needs. We will guide the conversation along the below overview, but will take it along an organically developed path inspired by both the panelists and the audience.

2 CONVERSATION OVERVIEW

We will begin the discussion exploring what cloud computing means to our panelists, in both past and present roles. Do they think mainly of the ability to spin up computers connected together in software-configured ways, and run computations on them, or do they think more of managed software solutions. What is the cloud good at doing for them, where does it currently fall short, and how are things changing to address those shortcomings? This might touch on topics like price, security, and ease of use, leading to discussions of specific technologies like cheaper interruptible instances, security primitives, and the current cloud ease of use experienced by Visual Effects practitioners.

How does the model of being able to rent computers by the second or the minute affect usage of the cloud? What kind of price point or convenience is needed to essentially replace on-premises render farm deployments, and are we close to that or already there?

Changes are occurring with improved computer hardware like GPUs, large RAM, and large SSDs available in the cloud and faster internet connections. This enables both GPU-accelerated renderers and workstations in the cloud. What happens when all a Visual Effects studio needs on-premises for an artist is a Zero Workstation terminal and a fast workstation?

There is now a large corpus of open source software libraries available, produced and consumed by Visual Effects and Computer Animation companies, and a standard has emerged, the VFX Reference Platform, providing recommended software versions for a subset of it. How is this affecting the creation of software for Visual Effects, and how much do studios themselves directly use these libraries? For Software Vendors, how does one choose when to use a software library, write something proprietary, or contribute to the commons? Does the availability of all this open source software create new opportunities for disruption by providing a higher bar as the starting point?

Large studios tend to have highly customized, built-out visual effects pipelines, while small studios often have more flexible structures. How does this affect their respective adoption of cloud technologies? Is deep customization a benefit or an impedance to a studio, e.g. when going from Python 2 to Python 3, or extending one's render farm to the cloud?

Thinking further into the future, will more aspects of rendering and content creation move towards managed services? What does a DCC application look like "as a service," and where do all the sophisticated user interface and scriptability hooks fit? Alternatively, will some parts of the Visual Effects production remain as desktop software indefinitely? An interesting finishing point of the panel might be to ask, if given a magic wand, what the software for Visual Effects would look like today, and how Visual Effects studios would use it.