

DELLTechnologies

DELL TECHNOLOGIES OFFERS SOPHISTICATED END-TO-END SOLUTIONS FOR MEDIA & ENTERTAINMENT:

When companies team up with Dell, they get cutting-edge tools to create breakthrough work and an industry-savvy partner to support them throughout the entire process, from inception to delivery of content.



 Windows 10

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INTRODUCTION

Globally, the media and entertainment industry is valued at \$2.3 trillion and expected to reach \$2.6 trillion by 2023. The U.S. market makes up roughly a third of this market at an estimated \$717 billion in 2020, with growth expected to reach \$825 billion by 2023¹

Though some of this growth is attributed to businesses not traditionally associated with media and entertainment (e.g., museums, education and training) that are now developing media content, the “stars” of the industry are those companies that create content for movies, television and games. These traditional media and entertainment entities make up the bulk of the industry.



Though they may be at different stages along the technology evolution timeline, the majority face common challenges.

An increasing number are involved not only in the creation and production of media content, but have also the task of distribution. This includes providing the on-demand data-streaming of films, games and TV shows, often for high-definition monitors (streaming simultaneously, but staggered), requiring massive amounts of data processing and storage.

Given the rapid pace of technological evolution, studios struggle to provide the best tools to enhance, rather than inhibit, artists' creativity as they work to develop ever more immersive visual effects or impressive animation sequences.

The process of creating high-quality visual effects and animation for a production is time-, labor- and iteration-intensive. This generates enormous amounts of data, which can cause bottlenecks and wreak havoc on workflow.

Additionally, the process of creating visual effects and animation is an inherently collaborative process. Multiple artists and technicians often need access to the same work-in-progress, or different versions of the same frames, at the same time in order to apply their specialty, be it rendering, iterating, or adjusting the color or lighting of an image. This can create what's known in the business as collaboration friction, which can also impede workflow.

To address these challenges, companies are turning to technology. They are looking for solutions that deliver sophisticated and agile tools, powerful computing and data processing, and ample storage options.

“Dell Technologies is the only Technology Partner on the planet that can offer a genuine end-to-end portfolio of infrastructure, software, services and partnerships, due to breadth of portfolio, depth of subject matter and industry experts,” said Alex Timbs, former head of IT at Animal Logic and now a senior business development manager at Dell Technologies. “Dell understands that success in M&E is about pipeline automation, low friction collaboration and clear value, all achieved by establishing a “Collaboration First” strategy.”

Dell Technologies has focused on hiring industry experts like Timbs, who bring a wealth of experience to each partnership, working with each client to build and test the perfect solution for their specific workload ecosystem.

¹Source: <https://www.statista.com/statistics/237749/value-of-the-global-entertainment-and-media-market/>



EXECUTIVE SUMMARY

While nuances of challenges in media and entertainment companies differ, there are a lot of commonalities:

- ◆ The need for a cutting-edge technology system that provides end-to-end support, from inception through production, and then finally through delivery of content.
- ◆ Sophisticated technology tools that enhance, rather than constrain artists and allow them to push the creative envelope on each project.
- ◆ Powerful computing and data processing power, plus loads of storage, including utilizing the cloud for iterative collaboration.
- ◆ Scalable solutions that can adjust to cyclical shifts.

As a leader in the field of media and entertainment technology, Dell Technologies offers a complete set of end-to-end solutions to help clients fulfill their creative and business potential. With a wealth of experience in the industry, Dell Technologies helps clients configure the solutions that meet their particular needs and keeps their workflows streamlined.

Solutions include such elements as:

- ◆ Dell Precision workstations and Dell UltraSharp monitors for content creation.
- ◆ Dell EMC PowerEdge servers for a comprehensive range of servers for compute-intensive tasks.
- ◆ Dell EMC Networking for distributed workflows and high-speed stitching.
- ◆ Dell EMC PowerScale (Isilon) offers a range of high-capacity storage solutions.
- ◆ Dell Technologies Cloud Platform helps reduce operational complexity, no matter where workloads are running.



For years, Dell Technologies has collaborated with industry leaders Sony Innovation Studios, MPC Film (a division of Technicolor), Important Looking Pirates and Animal Logic.

In each case, Dell Technologies has served as a business partner, supporting each studio in their never ending quest for pipeline evolution, needed to support their creative and business goals.





CASE STUDIES

Academy Awards and nominations don't just happen. They are the result of inspired ideas, talented people, hard work and, these days, a whole lot of computing and data processing power, not to mention ample storage.

A range of award-winning visual effects and animation studios already rely on Dell Technologies and their partners to make their work the best it can possibly be.

Here, a look at a few industry leaders whose businesses are thriving, thanks in part to their collaboration with Dell Technologies.



PETER RABBIT™ images © 2018 Columbia Pictures.



The LEGO Batman Movie images © 2017 Warner Bros. Pictures.

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SONY INNOVATION STUDIOS

Launched in June 2018, Sony Innovation Studios (SIS), a division of Sony Pictures Entertainment, is pioneering production technologies to deliver state-of-the-art entertainment experiences. Housed in a soundstage on the Sony Pictures Studio Lot in Culver City, California, SIS is empowering storytellers around the world to produce content using new technologies, tools and techniques. Among these new technologies, SIS is working to advance real-time volumetric virtual production with the launch of its revolutionary Atom View software solution. Atom View is a point-cloud rendering, editing, and coloring software solution. Beginning with a high-quality *volumetric image acquisition*, Atom View produces a photo-realistic three-dimensional recreation of a physical environment which can be used for volumetric virtual production of motion picture or television content.

“This technology really empowers creatives to explore new possibilities,” says Nicole Franco, Manager of Operation and Production at Sony Innovation Studios. “They can do shots they’ve never done before. They can film anywhere. They can film in New York, they can film in LA, they can film in Paris, all on the same stage.”

In short, the process allows filmmakers and directors to capture imagery of actors in front of a green screen as in the past, but instead of inserting elements via CGI in post-production, they are able to integrate live action with digital assets in real time on monitors as

“Where, before, it would take days and days and days to try to process all that and get it together. My Precision workstation actually allows me to do that quickly.”

David Bailey,
Director of Volumetric Image Acquisition,
Sony Innovation Studios.

they are shooting. Filmmakers can also use this technology to shoot in front of a large on-set LED screen thereby allowing directors, cinematographers, and actors to experience the background and scene live as if they are actually there. It provides creative flexibility where film productions can take place at any time in front of different environment and scenes the same day at the same location.

This process was used when SIS captured a virtual model of the *Men in Black™: International* movie set in the United Kingdom, covering 52,000 square feet. That MIB virtual set was used for a [NBA Finals co-promotion](#), shot in Culver City, California, and aired on ESPN and ABC. By using the virtual set, producers were able to save on overseas travel costs, set decoration and time. The software technology



helped achieve a nearly impossible mission – collapsing geography and re-creating a set that had already been dismantled. This same process was also used in creating a virtual model of the exit interview [set on “Shark Tank”](#) in 2018 earning SIS an Advanced Imaging Society Award for Best Use of Virtual Production.

Of course, volumetric capture is an intensive process requiring substantial bandwidth in computing, networking and high-performance storage. “I’m capturing about two or three hundred million pixels per shot,” says David Bailey, Director of Volumetric Image Acquisition at Sony Innovation Studios. “Where, before, it would take days and days and days to try to process all that and get it together. My Precision Workstation actually allows me to do that in a few hours.”

This technology will prove valuable to those working on blockbusters and indie films alike. Additionally, Glenn Gainor, Head of Physical Production at Screen Gems, Sony Pictures Entertainment, believes the approach will democratize storytelling by bringing down the costs of filmmaking, while also creating immersive experiences that have previously been impossible to create.

To help carry out this work in virtual production and post-production, SIS turned to Dell by using various equipment including the Dell PowerEdge Servers, Dell EMC Networking, PowerScale/Isilon Storage and Dell workstations.



MPC FILM

MPC Film, a division of Technicolor, is an award-winning visual effects and computer animation company headquartered in London, with facilities located in Los Angeles, New York City, Montreal, Amsterdam, Bengaluru, Paris and Shanghai. The company has worked on such films as *1917*, *The Lion King*, *Blade Runner 2049* and *The Jungle Book*, among others.

MPC Film is the world's largest computer-generated production company. In other words, MPC Film requires a lot of cutting-edge technology to repeatedly turn out Academy Award-winning films.

"When one produces imagery at the levels of quality and sophistication that we do, every single frame is composed of hundreds, even thousands, of digital assets," says Biren Ghose, Country Head for MPC's India facility.

Considering that simulations like water, fire or destruction generate terabytes of data, it takes a huge amount of computing power, data processing and storage to keep the workflow moving.

"The explosion of data and the expectations of managing high-end productions with demanding schedule necessitates that we provide the most comprehensive and user-friendly tool sets," says Ghose.

To meet these demands, MPC Film employs Dell Technologies, including Dell Precision workstations, Dell PowerEdge Servers, Dell EMC Networking and PowerScale/Isilon Storage.

"Dell is witness to our reality where innovation and change is a constant for both our brands and for our clients," says Ghose. "The key is to constantly invent more efficient and optimal methods of production. Private cloud, virtualization, workforce transformation, new apps, secure data management, as well as highly efficient and robust computing power are all the parts of this constantly evolving recipe."

Ghose says that transformative work is possible when artists have access to world-class tools.

"In working with Dell, we must keep innovating to make sure that both the artist and the machine are simultaneously capable of upgrading to new levels of sophistication."



1917. Credit: Universal Pictures

The Lion King. Credit: Walt Disney Studios

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Westworld: Image courtesy of HBO

IMPORTANT LOOKING PIRATES

Important Looking Pirates (ILP), one of Scandinavia's biggest visual effects and digital animation studios, is well-known for its world-class work on such films as Jurassic World: Fallen Kingdom and The Shallows, as well as television productions Black Sails, Westworld and Lost in Space.

One sequence from the latter involved creating an enormous water simulation, spanning miles and composed of billions of water particles, which generated more than 500 terabytes of data. Compare that with a smaller-scale water simulation the company created for Star Wars: The Last Jedi in 2017, which generated a mere 30 terabytes per iteration, and one can see how rapidly entertainment technology is evolving to meet the demand for ever more impressive visual effects at higher resolutions and for larger video formats.

"Our business is artistry and growing demands from our clients require us to push technical and creative boundaries," says Angelo Rivano, Chief Technology Officer at ILP.

*To meet these demands,
ILP turned to Dell.*

ILP's high-performance computing infrastructure and technology for artists at ILP includes Dell EMC PowerScale/Isilon scale-out storage, Dell EMC PowerEdge servers, Dell Precision Rack workstations, Dell HD display monitors and Dell EMC Networking switches. It runs a variety of visual rendering, editing and animation software.

"When we standardized on Dell EMC Isilon for our storage platform, we expected to double or triple our performance and capacity over two years," says Rivano. "Instead, we grew five times from 300 terabytes to 3.6 petabytes in a year and increased performance to a similar degree. Dell EMC clearly was the right choice since it scaled so simply and to such a high ceiling."

What's more, artists were not only able to achieve artistic and technological breakthroughs using Dell equipment, they report that they were able to improve their quality of life through a better work-life balance due to remote access.

"The fact that I can now remotely connect to my workstations from at home means that the late nights have been pretty much reduced to zero," says Juri Bryan, Head of Effects at ILP. "It makes for a way better life quality."

Rivano says that ILP places high value on Dell EMC's ability to provide end-to-end solutions.

"The breadth of the Dell EMC portfolio and being able to talk to a single vendor about solutions from top to bottom are huge advantages," says Rivano. "Dell EMC has decades of experience in the media and entertainment industry, so we talk to them mostly about business requirements instead of speed and feeds. As one of our most trusted advisors, Dell EMC gives us valuable feedback on our ideas and how to move our business forward."

Watchman: Image courtesy of HBO



ANIMAL LOGIC

With animation studios in Sydney and Vancouver and development offices in LA, Animal Logic has been producing award-winning visual effects and animation for almost 30 years. From making VFX magic for *The Matrix* and *Captain Marvel* to creating dancing penguins for *Happy Feet*, heroic minifigures for *The LEGO Movies* and mischievous bunnies in *Peter Rabbit*, Animal Logic has used technology to bring stories to life for audiences around the globe.

According to Aidan Sarsfield, head of production technology, one of the reasons the company has had so many breakthrough successes is that artists are always front and center.

“We really want the creative process to be fluid, and for technology to support our artists in producing great work and coming up with great ideas,” says Sarsfield. “It’s all about improving the artists’ experience, improving their ability to collaborate, and ultimately, increasing the visual fidelity of the work they create.”

For example, in the *Peter Rabbit* movies, where computer-generated characters inhabit a live-action movie world, artists used technology to push the envelope, working to make the animated characters appear more realistic and for their facial expressions to be more nuanced than in past projects. Even from the first to the second movie, the team worked tirelessly to boost the fur density of the animals. In the end, some characters had as many as eight million strands of fur, each with multiple vertices that could be flexed via computer whenever the animal encountered an outside force such as wind.

“When you have 300 artists all working simultaneously on the project, it creates a huge amount of complexity,” says Sarsfield.

PETER RABBIT™ images © 2018 Columbia Pictures.



“When you have 300 artists all working simultaneously on the project, it creates a huge amount of complexity,”

Aidan Sarsfield,
Head of Production Technology

The LEGO Batman Movie images © 2017 Warner Bros. Pictures.



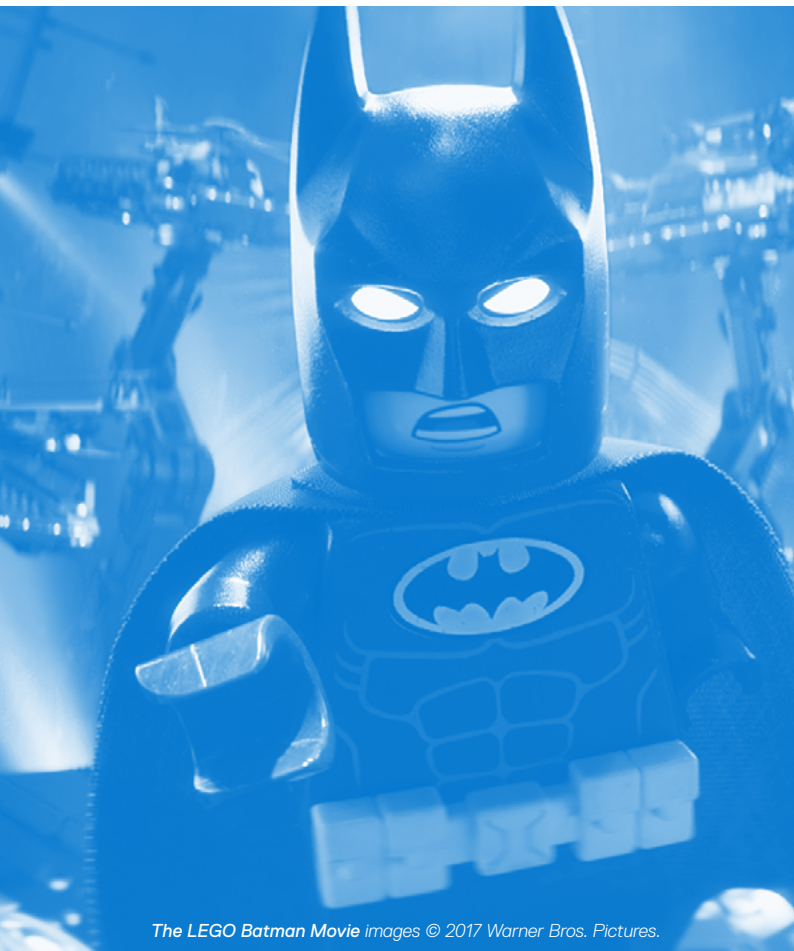
In fact, one of the challenges that Animal Logic (and other studios involved in large-scale content creation) face involves enabling artists to work simultaneously on the same material or on different versions of the same frame or sequence.

“We work in nonlinear pipelines,” says Sarsfield. “Essentially, we can have an animator working on a shot at the same time as an effects artist and a lighting artist.”

Animal Logic uses a wide range of Dell Technologies to create such nonlinear pipelines and improve workflow, without sacrificing artistic output. This includes Dell Precision workstations, Dell UltraSharp monitors, PowerEdge servers and Dell EMC networking. The company also employs the Dell EMC management platform, which Sarsfield says is easy-to-use and includes relevant tools for the industry.



Happy Feet images © 2006 Warner Bros. Pictures.



The LEGO Batman Movie images © 2017 Warner Bros. Pictures.

Additionally, because work is cyclical and space can be an issue, Animal Logic occasionally employs on-premise storage to house necessary equipment. In at least one instance, this included a container equipped with hardware by Dell EMC, designed specifically to meet Animal Logic’s needs and space constraints.

Sarsfield says it has been important for the company to partner with somebody that can support that kind of complexity and guide them through the process.

“Dell is an end-to-end technology partner,” says Sarsfield. “They really understand the needs of media and entertainment, and in that context, they collaborate with us on the solutions that we’re trying to provide for our artists. For me, who’s very much focused on artist workflow, that’s the most important thing, having a collaborative partner that can understand and meet our needs.”

**Dell Technologies Media
& Entertainment**

SUITE OF TOOLS

Dell Precision Workstations

Dell has a full range of powerful workstations, from mobile to top-end powerhouses. They all benefit from independent software vendor (ISV) certification, so users can be assured that their professional software will run as intended. On top of this, the Dell Optimizer for Precision automatically tunes the hardware for specific applications, with performance gains and time saving options. Dell Technologies can also provide Precision workstations with custom images that include all the software used by a client company, including any necessary agents for storage.



Why Windows 10 PRO works well with Dell Precision Workstations

With Windows 10 Pro for Workstations, you can power through advanced, compute-intensive workloads with server-grade data protection and performance.

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**Below are just some of the reasons
Dell Precision workstations will
make a perfect partner:**



- Award-winning designs and the smallest mobile workstations.*
- Dell Optimizer for Precision software.
- Revolutionary patent-pending thermals.
- Outstanding front-of-screen experience; 4K, 8K, HDR and InfinityEdge monitors.
- The most complete portfolio,** including 1U and 2U racks for remote, secure solutions.
- “Ready for VR” solutions.
- World-class ecosystem, services and support.

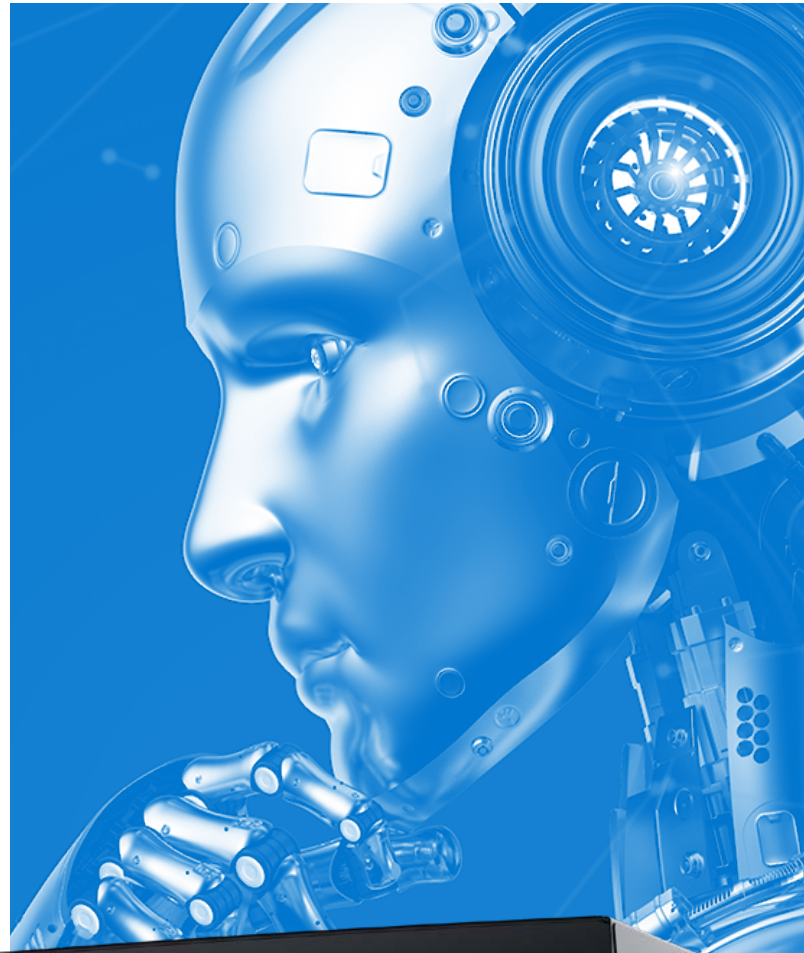


*Based on Dell analysis using publicly available data, January 2020. The smallest refers total surface area of the 5000 series mobile workstations.
**Dell Technologies is the only tier 1 vendor to offer mobile, tower and rack workstations.



DELL ULTRASHARP MONITORS

Dell UltraSharp monitors are exquisitely crafted for the ultimate experience that pushes your work to new heights. The UltraSharp PremierColor monitors offer phenomenal, true-to-life colors, tremendous level of detail and extensive customization of color parameters. While calibrated at the factory for precise color accuracy, some select monitors also come with built-in colorimeter for effortless calibration so you can rest assured that the display retains true colors your project demands. To cater to the unique needs of M&E professionals, these monitors are offered in different sizes and resolutions ranging from a 27" 4K UHD to 32" 8K UHD and in varying form factors and aspect ratios including UltraSharp curved monitors that are ideal for GUI users. By deploying UltraSharp monitors across the workflow, users can expect high color fidelity and accuracy, from pre-production to final editing.



Dell recommends Windows 10 Pro for business



DELL EMC NETWORKING

Dell EMC Open Networking Fabrics offer an innovative disaggregated hardware and software solution for IP transition in media industry. Based on our dependable, Z-series and S-series switch hardware and SmartFabric OS10 and SONiC software options, these solutions give you the power to transform your network and accelerate media network innovation with simplified, high-capacity network fabrics. Designed to ease network fabric orchestration and automation, Dell EMC Open Networking switch solutions are easy to deploy, cost effective and provide a clear path to scalable media & entertainment networking.

Dell EMC Open Networking IP fabrics for media & entertainment is based on the low latency and deep buffer Dell EMC Open Networking switches which help to optimize media workflows. Dell EMC Fabric Design Center and SmartFabric Services which is a component of SmartFabric OS10, are additional options to help simplify and automate the deployment, monitoring and life cycle management of these fabrics.



DELL EMC POWEREDGE MX SERVERS

The PowerEdge MX Modular solution effectively addresses today's growing business requirements for CIOs across all business segments, while being agile enough to morph into the unknowns of tomorrow.

This modular foundation provides a solid technical solution and protection for complex data center overhauls. Powered by the latest generation of Intel® Xeon® processors, the PowerEdge MX coupled with Dell OpenManage Modular gives Solution Providers a proven framework and cohesive design which they can confidently deploy into their customer's environments.

DELL EMC POWERSCALE

The PowerScale storage family builds on the legacy of Dell EMC Isilon, already trusted by studios, VFX houses, broadcasters and telcos around the world and includes small form-factor, all-flash nodes, offering the same enterprise-level performance and features packed into 1U.

Unlock collaboration - PowerScale offers a centralized, consolidated, collaborative storage environment that enables concurrent, real-time collaboration with multi-protocol access, integration with key partner software and easy search across multiple storage types. Unlock collaborative tools and processes that allow artists, systems and broadcast engineers to leverage common stored assets whether at the edge, on-premises or in the cloud.

Reduce costs and maximize value - PowerScale is simple to install, manage and scale, greatly reducing operating expenses. PowerScale's modularity and scalability allows for granular project-based provisioning, making it easy to control workflow costs. PowerScale OneFS offers flexible storage options including all-flash, hybrid and archive nodes. Pick and choose the nodes that make the most sense for your business, whether you are starting small or want to expand existing Isilon clusters with new PowerScale all-flash nodes.

Gain control and insights - Dell EMC DataIQ provides the tools to simplify and automate the management and movement of data across PowerScale, cloud and even third party storage platforms. Take advantage of in-place analytics to optimize every aspect of content creation, packaging, and distribution, across heterogeneous environments.

HYBRID NODES

Hybrid storage platforms powered by the Powerscale OneFS operating system uses a versatile yet simple scale-out architecture to speed access to massive amounts of data. These hybrid platforms are highly flexible and strike the balance between high capacity and high-performance storage to provide support for a broad range of media and entertainment workflows.

- ◆ Isilon H400
- ◆ Isilon H500
- ◆ Isilon H5600
- ◆ Isilon H600

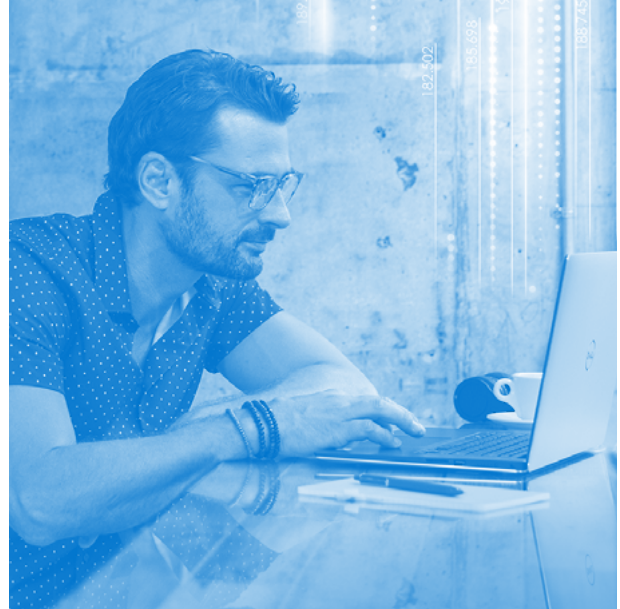


ALL-FLASH NODES

New PowerScale all-flash storage platforms – powered by the OneFS operating system – provide a powerful yet simple scale-out storage architecture to speed up access to massive amounts of unstructured data while dramatically reducing cost and complexity.

- ◆ PowerScale F200
- ◆ PowerScale F600
- ◆ Isilon F800 and F810





DELL PROSUPPORT

Fast proactive IT support for your business. A team of engineers is always accessible to provide you with help for any hardware and software issues.

DELL TECHNOLOGIES ON DEMAND

Dell Technologies On Demand provides more choice, flexibility, and predictability in how you and your customers consume IT infrastructure. Flexible payment solutions spanning our leading end-to-end portfolio help you deliver consumption-based and as-a-service delivery models ideally suited for the way technology infrastructure is consumed in today's on-demand economy.

DELL EMC VXRAIL

Harness the power of a turnkey HCI system with automation, orchestration, and lifecycle management with extreme performance for demanding graphic intensive use cases.

With the addition of the latest NVIDIA® Quadro RTX™ 8000 GPUs, designers and artists across industries can now expand the boundary of what's possible, working with the largest and most complex graphics rendering, deep learning, and visual computing workloads.

DELL CLOUD

One of the most positively disruptive technology trends in decades, the cloud operating model is often well aligned to many points in a media pipeline, particularly peak render and distributed workloads. Dell mobilizes media workflows by leveraging new and existing platforms and tools to increase Cloud readiness and to speed up Cloud adoption. Dell Technologies can help you navigate new cloud-based creation and distribution paradigms, aimed at improving your business agility, and flexibility, all while lowering costs. With Dell Technologies Hybrid Cloud solutions, you avoid cloud "lock in", enable least cost routing, use compute, analytics tools, and other services from different clouds against the same data without having to move it between clouds, or pay for copy to sit in each of them. This truly unlocks all clouds' services and infrastructure to be available to your business in a cost-effective way.



CONCLUSION

Although the quantifiable benefits of computing products generally revolve around performance, price and how those two interrelate, these aren't the only factors in a hardware purchase in the media and entertainment industry. Just as significant is whether the vendor understands the industry and the workflows of a particular company.

At Dell Technologies Customer Solution Centers, industry-knowledgeable solutions architects can help potential customers set up specific hardware combinations, using the client's preferred software and own content samples, to realistically test what a particular production environment could bring to their business.

In the case studies of Sony Innovation Studios, MPC Film, Important Looking Pirates and Animal Logic, Dell has clearly supported the work of each of these industry partners. Working together, they have configured the right hardware and software to optimize each client's creative output and workflow, while eliminating bottlenecks and collaboration friction.

In short, Dell Technologies is an invested partner in helping its media and entertainment industry partners achieve their creative and business goals.

And in most of these cases, their collaboration has resulted in the studios receiving some of the industry's highest accolades in the form of Academy Awards or nominations for their work in visual effects and animation.

"The underlying driver and the thing that's different about media and entertainment is this; the technology that they're using is literally the canvas on which they're creating beautiful images," says Alex Timbs. "There's no other business out there, really, where technology is actually the art."



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