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High-Performance Workstations Powering Mission-Critical Workloads

Linn Huang
Research Vice President,
Devices and Displays, IDC

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IDC OPINION

Over the past decade, forward-thinking organizations have been accelerating their digital transformations to improve internal capabilities and stay competitive in an increasingly digital world. Consequently, the demand for tech talent and the sophisticated tools they run has steadily risen. For companies that produce and leverage digital content, ISV-certified workstations ensure their mission-critical workloads run optimally.

Two hallmarks of workstations are performance and reliability. Workstations are typically deployed into highly technical and resource-demanding use cases. Across manufacturing, architecture, engineering, and construction, designers use workstations for everything from 3D modeling to visualization, simulation, analysis, and fabrication. In media and entertainment, artists use workstations to render cutting-edge visual effects (VFX) and graphics in cinema and gaming. Top software engineers and data scientists are also using workstations to develop the most powerful AI models of today. Summarily, workstations are built to meet the most compute-intensive tasks.

However, it's not just the performance that makes a workstation a workstation; it's the reliability underlying all that performance. The aforementioned use cases not only require high-performance computing but also often carry mission-critical workloads that represent the lifeblood of a company's business. Workstation OEMs invest substantially into their workstation brands so that workstation users can work with confidence. This includes getting their devices continually certified to optimally run major software solutions such as Autodesk Revit, Siemens NX, Dassault SOLIDWORKS, and Autodesk Flame. Workstation buyers know they are getting performance they can count on.

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Workstations are also highly configurable across form factor, spec and feature set, price, and performance. Premium desktop workstations with 12+ CPU cores are increasingly being used to drive some of today's most complex content. This paper discusses the market for such workstations including the Lenovo ThinkStation P620 Workstation powered by AMD Ryzen Threadripper Pro processors.

The world is becoming more and more digital with a growing amount of digital goods, services, and content. Companies across all sectors can now leverage digital mediums to engage with their customers. If creating digital content is becoming an increasingly important part of your business, take a cue from today's top architects, designers, artists, engineers, and scientists and consider deploying workstations, the ultimate professional content creation tool.

SITUATION OVERVIEW

Among premium desktop workstations with 12+ cores, Lenovo boasted the largest shipment volumes in 2022, 2023, and so far through the first quarter of 2024, according to IDC's tracker. With the ability to go up to 64 cores, the ThinkStation P620 can handle any multithreading task. Let's see how some of today's leading companies leverage all that power for their mission-critical workloads.

Respawn Entertainment is a game development company putting out some of today's most popular AAA video games including Apex Legends, Titanfall, and the Star Wars Jedi franchise. One entry in that latter, Star Wars Jedi Survivor, was in early development when the COVID-19 pandemic initially broke. Suddenly, a team of developers that were used to working together on campus were sent home to work remotely. Here a host of technical issues started arising.

Star Wars Jedi Survivor is an ambitious entry. Large cast of narrative and combat characters means substantial amounts of facial expressions, gestures, and movements to animate. Moving from corporate LAN to VPN on residential networks severely slowed down development time and put the project in jeopardy. Speed in the development process is critical to endgame quality. As Respawn VP and Head of Technology, Fred Gill put it, "The faster that we can iterate and get that into the hands of our dev team, the better quality we get to, and ultimately that's the better game for the players."

So how did Respawn regain its development speed when the world came to a halt? Enter the Lenovo ThinkStation P620 powered by AMD Threadripper Pro. The P620 and its beastly amount of cores, when deployed to each developer, helped cut build time down significantly. Before deployment, build times for cooked and packaged builds

were running upward of 15 hours. The P620 got those build times down to as low as 4 hours.

Originally, Respawn chose AMD because AMD platforms also power fifth-generation gaming consoles, which Respawn develops for. However, it got so much more back than just platform compatibility. As Technical Director Jon Carr states, "The boon to development that AMD Threadripper Pro had for us honestly can't be overstated. It's very empowering to our team and the whole entire project. And that uplift can be felt across the entire development cycle."

Lenovo's P620 also plays a critical role in another major star franchise. Pixomondo is an Oscar award– and Emmy award–winning VFX company. Historically focused on traditional visual effects, the company has recently pivoted hard toward virtual production and real-time technologies. These include massive sets with giant video walls and ready-to-produce stunning backgrounds and sets.

Pixomondo's first foray into virtual production was the show Star Trek: Discovery. The power the Lenovo P620 provided allowed the company to build the holodeck, light up underground space caverns on distant planets, and power amazing visuals of the insides of starships. In these virtual production sets, one down machine could spell blacked out panels, costing the production additional time and money.

Given the importance of uptime for Pixomondo and the Star Trek: Discovery crew, it's no wonder the company picked the P620 to power its stage. As the company's VAD Supervisor Zachary Dembinski states, "I think the hardware that we selected — the AMD Threadrippers and the Lenovo P620s — have never failed on us on that stage. They're going two years strong now, and they are under heavy workloads." In short, you can count on Lenovo P620 and AMD Threadripper Pro when lights are shining their brightest.

Lenovo workstations' real-world impact isn't just on digital output. Richard Childress Racing (RCR) is a long-standing NASCAR team founded in 1969. In the world of automotive racing, margins of error are narrow. A tenth of a second here and a tenth of a second there can spell the difference between victory and defeat.

RCR prides itself on its innovative spirit. The team decided to deploy Lenovo P8 (another workstation powered by AMD Threadripper Pro) to help in various processes. RCR uses workstations to help in the simulation and analyses that allow it to optimize its engine parts for peak performance. These simulations have been cut down to just 30 seconds using the Lenovo P8, which allows RCR to make better instantaneous decisions and provide real-time track support.

Our final case study vaults us into the world of AI, where OpenBCI is using Lenovo P620s to build a more ably equitable future. OpenBCI creates open source tools for

biosensing, and its most recent product is Galea, a biosensing headset that integrates EEG, EMG, EDA, PPG, and eye tracking. This technology could give researchers new ways to access and study the human body and mind.

The underlying technology could also be used to provide more opportunities for the differently abled. At TED2023, OpenBCI collaborated with disability rights activist Christian Bayerlein demonstrating how the former's technology could help someone with limited motor functions due to spinal muscular atrophy to pilot a drone.

Bayerlein identified several muscle groups he could most reliably fire. OpenBCI's technology then translated muscle activation into digital controls. After some time training as a new pilot, Bayerlein was able to fly the drone over the audience. This level of sensing and control generates a significant amount of data that must be analyzed in real time. For OpenBCI, Lenovo's P620 provided the necessary bandwidth needed to manage this level of data.

As stated by OpenBCI President and CCO, Joseph Artuso, "AI and wearable brain-computer interfacing will define the next generation of computers. Lenovo workstations are helping us to build that future at OpenBCI."

And if you need a reminder on what's at stake, allow Bayerlein to describe the impact technology can have on people. "Flying a drone has always been a dream of mine. I see it as a way to experience a sense of freedom and independence that is often limited by my disability, and being able to pilot a drone using my brain signals was an incredible experience that I will never forget."

FUTURE OUTLOOK

The acceleration of digital content, goods, and services is powering a computing revolution. IDC projects that technical application workloads (e.g., CAD, CAM, and AEC) will be among the fastest-growing workloads on enterprise infrastructure, with a 2023–2028 CAGR of 26%. AI will be a key area of investment, with enterprise spending on AI technologies to grow at a CAGR of 31%. To help power users keep up, deployments of premium desktop workstations are projected to grow at a CAGR of 8% during this same time period.

The professional content creation industry has exploded in scale and expanded in ecosystem in the past decade. More companies are driving digital content to the marketplace, while more individual users call themselves professional creators each year. We're also driving further into the age of AI. Content creators and AI scientists all require increasingly powerful tools to stay relevant in fast-moving fields. Workstations are the requisite tool for tomorrow's digital companies, professional creators, and data scientists.

OPPORTUNITIES/CHALLENGES

Opportunities

- Workstations provide high-performance computing for engineers, artists, designers, programmers, and other power users.
- Workstations are highly expandable, allowing for configurations that pack utmost performance, including multi-GPU rigs.
- Workstations are certified by some of the industry's most prominent software vendors, including Autodesk, Siemens, and Dassault.
- This reliability allows users to speed up task completion times, cut down downtime due to crashes, and improve the quality of their output.
- Workstations are used to develop and even train large AI models.
- Manufacturers generally back their workstation brands up with additional levels of support and service.
- Companies that have deployed workstations in the past have seen productivity gains from their power users to date.

Challenges

- While workstations can provide better TCO in certain use cases, buyers should expect higher up-front hardware costs owing typically to better, longer-lasting components.
- Workstations could overserve the computing needs of non–power users. Companies should be shrewd in deciding where to deploy.
- In lieu of its specialized nature, the workstation market is less diverse than the broader PC market in terms of vendor offerings and product mix.

CONCLUSION

Businesses have been transformed by the digital revolution in the past decade and will be thrust upon the AI revolution in the coming decade. Future consumers will demand more digital engagement with AI, providing a more targeted yet natural experience. The users that are creating the content and developing the models will require cutting-edge machines to stay in front of trends:

- Does my company rely on digital experiences to gain customers?
- Is AI crucial to our future?
- Do your engineers, designers, and data scientists use technical applications to build their products and offerings?

If you answer affirmatively to any of these questions, consider what many of your peer companies have already done by deploying workstations to your power users. Workstations help power users across many industries iterate faster, reduce downtime, and render more data in real time. They help companies plug value drains and get to market faster and more reliably. In short, workstations help companies keep up with the accelerating pace of the digital revolution as well as prepare for the coming AI revolution.

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Global Headquarters

140 Kendrick Street
Building B
Needham, MA 02494
USA
508.872.8200
Twitter: @IDC
blogs.idc.com
www.idc.com