

Smarter
technology
for all

Lenovo

LENOVO WORKSTATION WHITEPAPER
**Powering the Media &
Entertainment Industry**

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 **Windows 10**

The most powerful Windows yet

SMARTER CREATES THE FUTURE

4k. AR. VR. Mixed Reality. Deep learning. Simulation. Real-time rendering. The list goes on and on. Because, when it comes to leading the charge in technology innovation, the media and entertainment industry has always been at the forefront of innovation, bringing many of these trends into homes across the country and around the globe. But, keeping up with these trends—and being able to handle the complex tasks involved from preproduction to post—requires smart, advanced computing power often out of the purview of traditional PCs.

New Technologies. New Demands.

New technologies that once seemed futuristic are now making their way to the mass market. That means mass access to the likes of AR and VR programming. And, for those within the media and entertainment industry, that means a need to keep up with the latest AR and VR workloads and continue advancing creation, innovation, and production of this kind of programming.

**69% of experts predicted we
are 5 years away from the mass
adoption of virtual reality.¹**

In addition to increased access and demand for AR/VR, 4k content has seen a significant uptick, and is finally beginning to become widespread in the consumer market. However, content producers need to be prepared for what's to come, with machines that can handle production and render needs for 4k video, along with the likes of 5k, 6k, or even 8k footage, so as not to be left behind.



Sources

¹Clum, M. (2019, January 4). 7 Video Production Trends for 2019. Retrieved from <https://www.productionhub.com/blog/post/7-video-production-trends-for-2019>.

POWERING MEDIA & ENTERTAINMENT

Keeping pace with, and more importantly, staying ahead of trends means having access to technology that can support the demands of today's environments, while also preparing for the demands of future-forward technology.

When it comes to meeting the demands of preproduction, production, and postproduction environments, having the right computing power is a necessity—not an option. For those in media and entertainment—video editors, sound engineers, designers, and 3D artists—a powerful machine that provides uninterrupted operation, without downtime or lag is a must. That machine must also have the ability to process, render, and save high resolution content. This poses the question, why choose a workstation over a traditional PC?



Workstation VS PC

What's the difference between a workstation and a traditional PC? Or even a gaming laptop? The answer is multi-fold. And for those in media and entertainment professions, where high octane power is a must, workstations can provide a solid competitive advantage. While a standard PC can handle basic functions without an issue, the likes of word processing, web processing, and email, a standard PC isn't outfitted with the high-powered components required by the likes of photorealistic renderings, animation, or video and audio creation or editing. While the industry's technological advancements have enabled standard PCs to handle applications like Illustrator or Premier Pro, they struggle to complete complex, multi-layered projects. This is due to a standard PC's inability to feature high-octane processing power and high definition resolution needed to support intensive workflows.

But what, exactly, defines power and how much power is necessary for the kinds of tasks media and entertainment professionals often encounter? In order for smooth editing, rendering, and exporting, RAM is an essential component, and while desktops used to be the only formfactor powerful enough to handle the kind of RAM necessary, many laptops, like Lenovo's ThinkPad P1 running Windows 10 Pro, can come equipped with up to 64GB of DDR4 memory.

Beyond RAM, other factors, like the amount of CPU cores and cutting-edge storage technologies are essential in the workstation vs PC comparison. By choosing a CPU with multiple cores—those upward of six or even eight cores—users will experience a rapid lift in parallel processing ability, meaning that each core will be able to process a different action, allowing the whole to come together much faster. In other words, one core will be working to render certain aspects (brightness/contrast, time remap, shoulder and glow) at a particular frame, while other cores do other work.³

When it comes to hard drives, a device equipped with an SSD will rapidly outpace an HDD drive. In fact, an SSD drive is four-times faster than an HDD.² By utilizing an SSD device, editors are essentially able to speed up the reading of footage from the storage medium, allowing the entire editing, rendering, and saving process to move at a faster pace. Additionally, by choosing an SSD, you get super-fast dual M.2 NVMe support directly on the motherboard for many Lenovo Workstations.

In addition to CPUs and SSDs, graphics play an essential role in differentiating workstations from PCs and gaming devices. A discrete graphics card, meaning it has its own memory, is essential for high-performance when it comes to the likes of video editing. But why choose a workstation over a gaming PC? Even when it comes to gaming, the graphics cards, when working in tandem with other workstation components (not to mention ISVs, but we'll get to that in a moment) create an environment where a workstation PC can output perfect renders every time.⁴ Lenovo Workstations running Windows 10 Pro offer power-users top of the line discrete graphics cards from NVIDIA®, packing tons of power into both mobile and desktop form factors. Plus, with workstations, you get the added support of NVIDIA® Quadro RTX™ graphic cards, whereas gaming PCs can only support GeForce cards. But, what's the difference between these two, and why does it matter to you? The difference is in the details. In terms of the hardware itself, there's simply more graphical computing power in the Quadro line than in the GeForce line. The GPUs have just a little more juice. The Quadro cards also have more graphics memory, which can offer significant performance gains in professional workflows.

Another differentiator to consider when weighing the decision between Workstation or PC? Independent Software Vendor (ISV) certification. Workstations are ISV certified for certain applications, whereby hundreds of engineering hours and rigorous testing are poured into optimizing the machine for maximum performance and reliability with that application. By utilizing an ISV certified workstation, you can avoid crashes, latency, and other common performance issues that one would experience on a traditional PC. With an ISV certified machine, you know that your application is running in the ideal environment it was designed for, allowing you to maximize the use of the application. And, with Lenovo Workstations powered by Windows 10 Pro, you receive countless ISV certifications, ensuring optimum performance of necessary programs and software.

Sources

² Bastounis, O. (2020, January 16). The best computer for video editing in 2020. Retrieved from <https://www.creativeblog.com/features/best-computer-for-video-editing>

³ Hi, A. from C. G. D.- post. (2020, January 16). Best Computer for Video Editing (Updated). Retrieved from <https://www.cgdirector.com/best-computer-for-video-editing/>

⁴ Tabari, R. (2020, March 2). The best video editing laptops in 2020. Retrieved from <https://www.laptopmag.com/articles/best-laptops-for-video-editing>

THE CASE FOR WORKSTATION: How Lenovo P-Series Powers Production

So, how exactly do all of the components of a workstation come together to achieve the optimum output? Michael Ralla, VFX supervisor of Framestore, a Hollywood VFX studio, breaks down the creative process and how Lenovo Workstations help bring the movies to life.

How a Hollywood VFX Master Makes Movie Magic⁵

People looking at the creative process from afar see it as an individual's singular vision—for instance, a director conjuring a fantastical scene in his or her head. The reality, of course, is that it's a much more collaborative process. When that same director wants to transform imagination into movie magic—or any form of screen sorcery (television, commercials, gaming, VR and AR...)—he or she turns to a visual-effects wizard. And Michael Ralla, VFX supervisor at the Bafta- and Academy Award-winning creative studio Framestore, is one of the best in the business. His credits include some of the most dazzling effects spectacles of the past 15 years, including *The Avengers*; *Thor 2: Dark World*; *Iron Man 3*; *Harry Potter and the Deathly Hallows, Part 1*; and a pair of *Transformers* films. He was also part of the team that won a Best Visual Effects Oscar for *Avatar*.

More recently, Ralla has turned much of his attention to advertising. If you've seen the Toyota Supra spot "Wizard," which aired during the Super Bowl this past February, or "Welcome Home," the short film-cum-ad for Apple's HomePod directed by Spike Jonze (for which Ralla won a slew of advertising and VFX honors), you're familiar with his work. Ralla sees commercials as a way to get more intimately involved with his projects. "From the perspective of a VFX artist, you're a lot closer to the actual filmmaking process," he says. "In feature films, it was always about the final product. Now, it is more about how you get there and the actual collaboration with the director and the DP [director of photography]. On commercials, you have to figure out everything more holistically."

Ralla likens his role of supervising effects artists and digital compositors to that of a band leader. (Growing up in Achern, West Germany, he dreamed of making it as a drummer in a heavy metal band.) "I'm kind of the drummer of the team," he says. "I've got to make sure everything's moving and be the motor on those creative projects. Very often, it's having a vision and then giving feedback on how to get to it. Notes and ideas are the motor."

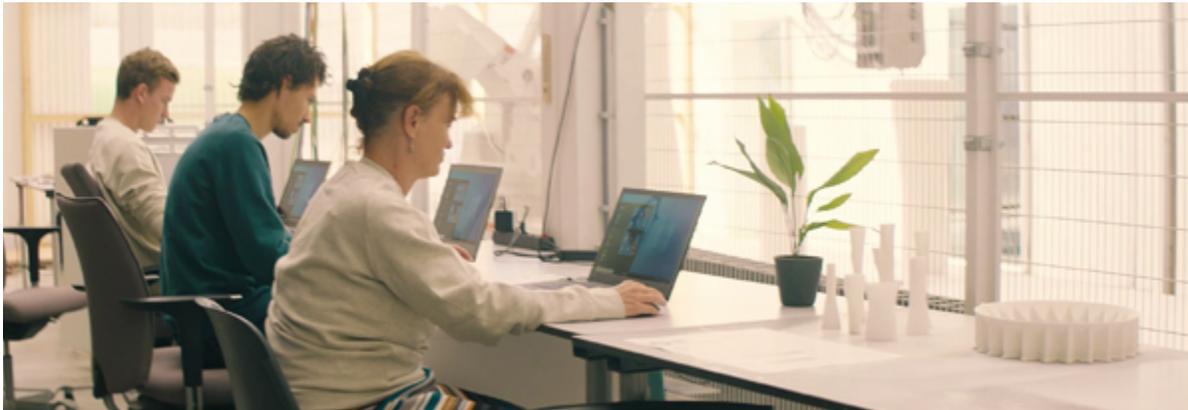
Ralla describes his team as a "rebel unit" with the room to continually test itself creatively. And even though the Framestore operation in Los Angeles—the company also has studios in New York City and London—has grown from 15 to 150 people, Ralla has been adamant about keeping his operation lean, even in the face of massive workloads. "One time, there was a huge project coming up, and it was really scary what we were facing," Ralla recalls. "One of my colleagues said, 'We need an army to do all this. We need to start hiring 100 people now.' I remember saying, 'No, I'd rather have ten people—like a Seal Team—instead of 100 regular foot soldiers.' With my approach, smaller teams of highly trained people are often a lot more efficient for what we do—you're a lot more agile and nimble."

Efficient Technology

As a result, Ralla places a tremendous amount of faith in—and pressure on—his team, making it essential they have both state-of-the-industry skills and technology. “We want them to have the best possible training and the best possible equipment,” Ralla says. “Budgets are getting smaller and smaller, and schedules are getting tighter and tighter, but the quality level that clients expect never gets lower—when they hire Framestore they expect top-end, feature-film quality,” he says. “And that’s where hardware comes into play, because we have a lot of computationally heavy stuff that needs to be processed, and we’re regularly hitting the limits.”

Ralla’s teams juggle things like real-time rendering with game engines, augmented reality, complex fluid simulations, as well as experimenting with taxing visual effects, such as leading-edge aging and de-aging. “All those workflows need a lot of computational power,” he says. To bring this visual data to life, Ralla’s teams lean heavily on VR-ready Lenovo ThinkPad P53 mobile workstations, with Intel® i9 processors, Quadro RTX4000 8GB graphics cards, a whopping 128 GB of RAM, and 2 TB hard drive disks—all readily available professional gear anyone can buy, mostly loaded with off-the-shelf software. As Ralla puts it, it’s the knowledge, skills, ideas, and creativity of the humans behind the machine that create the mind-blowing output.

Yet despite the muscular equipment he and his team rely on, Ralla doesn’t consider himself a machinehead. “I normally don’t rave about crazy-high data volume, insane render times, and technical specs,” he says. “When you go to a conference, you sometimes hear people saying, ‘This took 50 man-years to compute!’ I don’t find that impressive, because to me, it means that you didn’t manage your resources very well.” Ralla would rather brag about using technology economically: “It’s a lot cooler if you produce a stunning result and you say, ‘Yeah, it was actually simple because we found a really efficient and effective way to do all of this.’”



Sources

⁵ Bhattacharji, A. (2020, February 20). How a Hollywood VFX master makes movie magic. Retrieved from <https://www.fastcompany.com/90440534/how-a-hollywood-vfx-master-makes-movie-magic>

GET MORE WITH WORKSTATION FROM LENOVO

Like Framestore, media and entertainment professionals can put the power of workstation to work for them, reaping the reward of a high-powered system, built to deliver more—more power, more performance, more speed, and more reliability. With Lenovo Workstations users won't only experience the inherent benefits of workstations over PCs, users will experience exclusive Lenovo features designed to take workstation performance to the next level.

Why Workstation

While we've covered the ways that workstations outperform PCs in terms of hardware components, now it's time to take a deep dive into what differentiates Lenovo Workstations from the rest of the workstation category. For starters, Lenovo Workstations provide users with even more of the specs that matter most, coming equipped with the best industry offerings, while also allowing users to customize their build to meet their exact needs.

More GPU Strength

When it comes to complex graphic tasks, Lenovo Workstations offer content creators a competitive advantage. Designed to support one or more professional grade graphics cards, select ThinkPad P series laptops can be configured with the NVIDIA® Quadro RTX™ 5000 graphic cards. This not only enables mobile users to handle AR and VR content creation, which was previously reserved for desktop workstations, but it also allows for the deployment of mobile AI or demanding ISV workflows with ease.



More Processing Power

An immediate advantage that Lenovo Workstations offer users is the ability to configure builds with multiple, high-powered, multi-core processors. By incorporating high powered processes, applications often required by digital content creation fields will see increased responsiveness, all with the ability to run multiple applications without suffering from performance loss. Lenovo Workstations offer users access to the latest multi-core Intel® allowing users to customize their CPU requirements based on needs.



More Memory

Even base level workstations can be configured with twice the memory of a normal PC. And, with Lenovo Workstations, you get access to systems that support Error Correcting Code Memory (ECC) which automatically detects and corrects up to 99.9% of memory errors, allowing for improved data integrity and system uptime.



More Performance

Another area where Lenovo Workstations excel over the competition? Performance. Lenovo Workstations are built to maximize efficiency, increasing overall performance. Packed with all leading ISV certifications, Green certifications ensuring efficient energy use, and the lowest repair rates in the PC market, Lenovo Workstations offer users more of everything they need.



The most powerful Windows yet

EXPERIENCE THE LENOVO DIFFERENCE

At Lenovo, we focus on building machines that offer our users more power, more performance, and more industry-leading reliability than other workstation providers. By keeping the customer's needs in mind, our engineers have developed groundbreaking designs that have the raw power necessary to handle the most demanding workloads. So, what sets Lenovo Workstations apart from the rest? Let's take a look.

Innovation-First Design

Absolutely key for a top performing workstation? The ability for the machine to keep its components cool. And, that's where the patented Tri-Channel cooling in our towers and FLEX Performance cooling in our notebooks comes in. These revolutionary designs allow CPUs and GPUs to run at peak performance all while simultaneously keeping the components cool, which makes for a long lasting and reliable machine.

Cutting Edge Security

ThinkShield—Lenovo's suite of scalable and customizable security solutions—comes standard with our workstation products. ThinkShield helps to secure every aspect of your machine, making sure that your data, and the work that you perform is protected at all times thanks to layers of device, identity, online, and data security, including engrained hardware and software security measures. Plus, with a transparent supply chain from thoroughly vetting suppliers to secure disposal, exclusive WiFi security, and built in security measures like ThinkShield and ePrivacy screen on select mobile workstations, you know that your device is as secure as possible.

Optimal Performance

Lenovo Workstations are designed to get the highest performance out of every component. That's why we designed the Lenovo Performance Tuner, a free tool built by leading engineers to ensure your workstation is always optimized and running at peak performance when leveraging specific applications. One of the key advantages of Lenovo Performance Tuner? Its management of processor affinity. Unlike its competitors, the Lenovo Performance Tuner adjusts the affinity of other processes on the system in addition to the optimized application. This allows users to fully reserve CPU cores for the optimized application.



The most powerful Windows yet

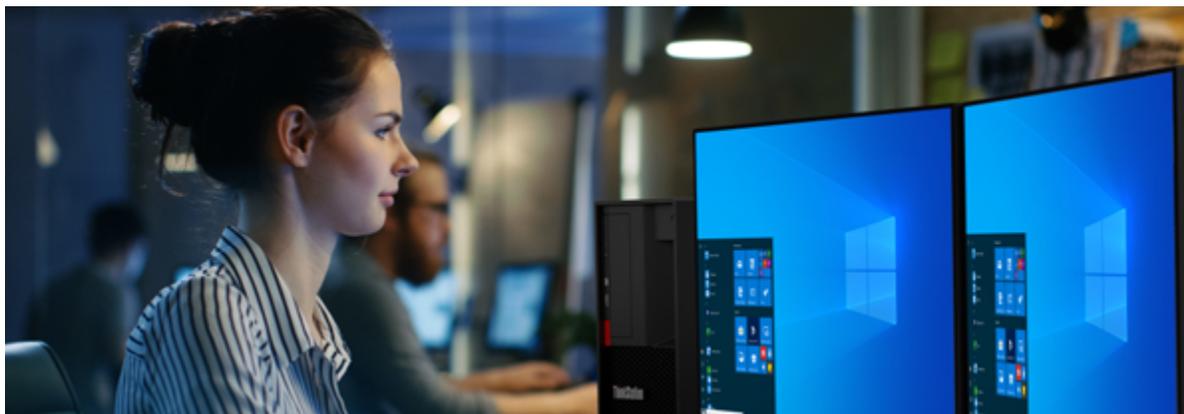
EXPERIENCE THE LENOVO DIFFERENCE

Industry-Leading Reliability

When investing in top-of-the-line machinery, it's important to know that the machine you depend on to do your job is reliable. Based on the 2019 TBR Report, Lenovo produces the industry's most reliable workstations—rated 74% more reliable than other workstation providers— with 21.4% lower repair rates than leading competitors. And, when polled, 91% of Lenovo Workstation customers would make their purchase time and time again.⁶ But why is this relevant? Because it ensures that you won't suffer downtime, increasing your productivity, and allowing you to concentrate on what matters most—the work at hand.

Lasting Relationships with Leading Partners

We're dedicated to working closely with leading partners so we can develop timely technological solution which addresses the industry's pressing needs. Take, for example, our relationship with NVIDIA®. Our users asked us for even more computing power in a mobile device, but it couldn't come at the cost of sacrificing anything else. Because of our close-knit relationship, we are able to respond to customer needs and, in this case, our relationship allowed us to be the first PC company to introduce a mobile workstation powered by the NVIDIA® Quadro RTX™ 5000 GPU. By closely collaborating with our suppliers we are able to provide timely technological solutions built to fit your needs.



The Right Workstation for the Job

Lenovo is proud to offer multiple workstations form factors, ranging from mobile workstations, to towers, to tiny devices. Why? Because choosing the right machine for the job is essential. Over the course of the next few pages, we'll explore several Lenovo Workstation offerings, outfitted with Windows 10 Pro, all with a variety of use cases and form factors.

Sources

⁶ PC Reliability Study. (2019, January 8). Retrieved from

https://static.lenovo.com/ww/docs/thinkstation/TBR_Lenovo_PC_Reliability_Study_Workstation_Overview_01182019.pdf

THE THINKSTATION P920

Looking for a tower that can handle anything that comes its way? Then look no further than the ThinkStation P920. Both VR and AR ready, this ThinkStation can handle even the heaviest of tasks. With its incredible specs, this ThinkStation can easily handle 4k, 6k, or 8k workloads, all with incredible fast transfer rates via thunderbolt.

Tech Specs

Configurable with Dual Intel® Platinum, Gold, Silver, or Bronze processors supporting up to 28 cores—there’s no task the ThinkStation P920, outfitted with Windows 10 Pro, can’t handle. Equipped with up to 128 GB of DIMM memory, and storage supporting up to 12 total drives, the ThinkStation P920 packs maximum punch.

Processor	Up to Dual Intel® Platinum, Gold, Silver, and Bronze (up to 28 cores, up to 4.4GHz per CPU)	
Operating System	Windows 10 Pro for Workstations	
Power Supply	1400 W @ 92%	
Graphics	Up to 3 x NVIDIA® Quadro® GV100 or P6000 Up to 2 x NVIDIA® Quadro RTX™ 8000	
Memory	Up to 2 TB DDR4 2933MHz MHz, 16 DIMM s (Dual processor required). Supports both RDIMM and LRDIMM 8 GB DIMM capacity	16 GB DIMM capacity 32 GB DIMM capacity 64 GB DIMM capacity 128 GB DIMM capacity (coming soon)
Max Storage	Up to 12 total drives Up to 4 internal storage bays Max onboard M.2 = 2 (4 TB)	Max 3.5" HDD = 6 (60 TB) Max 2.5" SSD = 10 (20 TB)
RAID	0, 1, 5, 6, 10	
Removable Storage	9-in-1 media card (standard) 15-in-1 media card reader (optional) 9.5 mm Slim ODD (optional)	
Chipset	Intel® C621	
Storage	3.5" SATA HDD 7200 rpm up to 10 TB 2.5" SATA HDD up to 1.2 TB	2.5" SATA SSD up to 2 TB M.2 PCIe SSD up to 1 TB
Front Ports	4 x USB 3.1 Gen 1 (Type A) Microphone	Headphone 2 x USB-C/Thunderbolt 3 (optional)
Rear Ports	4 x USB 3.1 Gen 1 (Type A) 2 x USB 2.0 USB-C (optional) Thunderbolt 3 (optional) Serial Parallel 2 x PS/2	2 x Ethernet Audio line-in Audio line-out Microphone-in eSATA (optional) Firewire (optional)
WiFi	Intel® Wireless - N 7260 AC 802.11 a/c, (2x2), 2.4 GHz / 5 GHz + Bluetooth® 4.2	
Expansion Slots	5 x PCIe x16 3 x PCIe x4	
Dimensions	7.9" x 24.4" x 17.6" (200 mm x 620 mm x 446 mm)	

Top ISVs

- Flame Resolve
- Maya 3Ds
- Premiere
- Unity
- Zbrush
- AVID
- Photoshop
- Unreal
- Nuke
- Cinema 4D
- Adobe CC
- Avid Media Composer

Ideal Use Cases

Perfect for production and postproduction, this machine is built to handle everything from modeling, digital sculpting, rendering, and texture painting to matte painting, dailies, and creative finishing. The P920 is perfect for handling the highest-performance workflows including rendering, simulation, visualization, deep learning, and artificial intelligence.

THE THINKSTATION P520

Built to handle 3D animation, VR, and more, the ThinkStation P520 delivers on jaw-dropping performance and stunning visuals, providing creative professionals with the power and performance they need. So, whether you're looking to create revolutionary designs or stunning special effects, this ThinkStation has all the strength you need to deliver an immersive experience.

Tech Specs

Featuring an Intel® Xeon® vPro® processor, and Windows 10 Pro for Workstation, this machine can handle all of your workflow needs. And, by supporting the latest NVIDIA® offerings, like the NVIDIA® Quadro RTX™ 6000 24 GB graphics card, there's no stopping what you can create.

Processor	Up to Intel® Xeon® W-2155 with vPro® (3.30GHz, up to 4.50GHz Turbo Boost, 10 Cores, 13.75MB Cache)	
Operating System	Windows 10 Pro for Workstations	
Power Supply	690 W @ 92% efficient 900 W @ 92% efficient	
Graphics	Up to NVIDIA® Quadro® P6000 24 GB Up to NVIDIA® Quadro RTX™ 8000 48 GB	
Memory	Up to 256GB DDR4 2666 MHz ECC (4 CH, 8 x DIMM slots)	
Max Storage	Up to 2TB SSD PCIe Up to 1TB SSD SATA Up to 2TB 7200 RPM Up to 12 total drives Up to 4 internal storage bays	Max M.2 = 2 (4 TB) Max 3.5" HDD = 6 (60 TB) Max 2.5" SSD = 10 (20 TB) On board: 2 x PCIe SSD M.2
RAID	RAID 0, 1, 5, 10 NVMe RAID 0,1 optional (Intel® RSTe vROC) via activation key	
Media Card Reader	9-in-1 media card reader	
Flex Module	9 mm slim ODD 1394 IEEE FireWire eSATA	
Ports	Front: 4 x USB 3.1 Gen 1** Type A Front: Mic/Headphone combo jack Front: 2 x USB-C/Thunderbolt 3 (optional) Rear: 4 x USB 3.1 Gen 1** Type A Rear: 2 x USB 2.0 Type A Rear: 2 x PS/2 Rear: USB-C (optional)	Rear: Thunderbolt 3 (optional) Rear: RJ 45 Gigabit ethernet Rear: Audio line in Rear: Audio line out Rear: Microphone in Additional ports available with optional Flex module upgrade
Physical Security	Optional key lock	
WiFi	Intel® Dual Band 8265 AC (2 x 2) + Bluetooth® 4.1 with vPro®	
PCI/PCIe Slots	2 x PCIe 3 x16 1 x PCIe 3 x8 (open ended)	2 x PCI3 3 x4 (open ended) 1 x PCI
Dimensions	6.5" x 18.0" x 17.6" 165 x 455 x 440 mm (33 L)	

Top ISVs

- Flame Resolve
- Maya 3Ds
- Premiere
- Unity
- Zbrush
- AVID
- Photoshop
- Unreal
- Nuke
- Cinema 4D
- Adobe CC
- Avid Media Composer

Ideal Use Cases

Perfect for production and postproduction, this machine is built to handle everything from modeling, digital sculpting and texture painting to matte painting, dailies, and creative finishing.

THE THINKPAD P1 MOBILE WORKSTATION

Meet Lenovo’s most powerful 15.6” mobile workstation to date, completely redesigned, the all-new ThinkPad P1 is built to take on and take down the competition by delivering more of everything you need. With the latest processors, cutting-edge graphics, and the ultra-premium, ultra-thin design makes this workstation a first-class choice for all intensive work on-the-go.

Tech Specs

Featuring the latest 9th Generation Intel® Core™ i9 vPro® processor, Windows 10 Pro, and a cutting-edge Dolby Vision™ HDR OLED 4K UHD display, the ThinkPad P1 is a creative’s dream machine.

Processor	Intel® Xeon® E-2276M with vPro® (2.80GHz, up to 4.70GHz with Turbo Boost, 6 Cores, 12MB Cache)	Up to 9th Generation Intel® Core™ i9-9880H with vPro® (2.30GHz, up to 4.80GHz with Turbo Boost, 8 Cores, 16MB Cache)
Operating System	Windows 10 Pro	
Display	15.6” UHD 4K (3840 x 2160) OLED, 400 nits, AR/AS, touchscreen Dolby Vision™ HDR 500 15.6” UHD (3840 x 2160) IPS 500 nits, anti-glare with Dolby Vision™ HDR 400	15.6” FHD (1920 x 1080) IPS 300 nits, anti-glare, 72% NTSC 15.6” FHD (1920 x 1080) IPS 500 nits, anti-glare, 72% NTSC, Dolby Vision™ HDR 400
Graphics	NVIDIA® Quadro® T1000 4GB NVIDIA® Quadro® T2000 4GB	Integrated Intel® UHD Graphics 630
Camera	HD 720p with ThinkShutter privacy cover Optional:IR & 720p HD Camera with with ThinkShutter	
Memory	Up to 64GB DDR4 2666MHZ Up to 64GB DDR4 2666MHZ ECC (Xeon® Processor only)	
Storage	Up to 4TB PCIe SSD	
RAID	0, 1 optional	
Battery	Up to 13 hours* on 80Wh, includes Rapid Charge technology** Up to 10 hours on a single one-hour charge	*Based on testing with MobileMark 2014. Battery life varies significantly with settings, usage, and other factors. **Requires 135W AC power adapter
Audio	Dolby Atmos® Sound System	
Security	Discrete Trusted Platform Module (dTPM) 2.0 Fast Identity Online (FIDO) authentication capabilities ThinkShutter webcam privacy cover Match-on-Chip Touch fingerprint reader	Optional IR camera for Windows Hello Kensington lock slot Optional Smart card reader
Ports	2 x USB 3.1 Gen 1** (1 always on) 2 x USB 3.1 Gen 2 Type-C / Intel® Thunderbolt™ 3 (DisplayPort, Data transfer) HDMI 2.0	Mini Gigabit Ethernet Audio combo jack Smart card reader (Optional) 4-in-1 media card reader (MMC, SD, SDHC, SDXC)
Connectivity	Intel® AX200 Wi-Fi 6 802.11AX (2 x 2)	Bluetooth® 5.0
Keyboard	Spill resistant Precision Keyboard with numeric pad	Backlit with white LED lighting
Weight	Starting at 3.74 lbs (1.69 kg)	
Dimensions	14.2” x 9.7” x 0.7” / 361.8 x 245.7 x 18.4 (mm)	

Top ISVs

- Flame Resolve
- Maya 3Ds
- Premiere
- Unity
- Zbrush
- AVID
- Photoshop
- Unreal
- Nuke
- Cinema 4D
- Adobe CC
- Avid Media Composer

Ideal Use Cases

Perfectly designed for design and pre-production tasks, the ThinkPad P1 mobile workstation can easily handle all your sketching, concept art, and storyboarding needs.

THE THINKPAD P53 MOBILE WORKSTATION

Unlock next level power and performance with the all new ThinkPad P53 mobile workstation. The ThinkPad P53 breaks performance barriers to achieve a new milestone for mobile workstations. Through impeccable design and engineering, Lenovo has created the most powerful 15-inch mobile workstation, offering users' desktop performance in a mobile form factor.

Tech Specs

Packed with the latest 9th Gen Intel® Xeon® and Core™ processors and the most powerful NVIDIA® Quadro RTX™ 5000 graphics, the P53 raises the bar for mobile-first, VR-ready, workstation power.

Processor	Up to 9th Generation Intel® Core™ i9-9880H with vPro® (2.30GHz, up to 4.80GHz with Turbo Boost, 8 Cores, 16MB Cache)	Intel® Xeon® E-2276M with vPro® (2.80GHz, up to 4.70GHz with Turbo Boost, 6 Cores, 12MB Cache)
Operating System	Windows 10 Pro	
Display	15.6" UHD 4K (3840 x 2160) OLED, 400 nits, touchscreen, AR/AS with Dolby Vision™ HDR 500, 100% DCI-P3 Color gamut 15.6" UHD 4K (3840 x 2160) IPS, anti-glare, 500 nits, Dolby Vision™ HDR, 100% Color gamut	15.6" FHD (1920 x 1080) IPS, anti-glare, 500 nits, Dolby Vision™ HDR, 72% Color gamut 15.6" FHD (1920 x 1080) IPS, anti-glare, 300 nits, 72% Color gamut
Graphics	NVIDIA® Quadro® T1000 4 GB NVIDIA® Quadro® T2000 4 GB	NVIDIA® Quadro RTX™ 4000 8 GB NVIDIA® Quadro RTX™ 5000 16 GB
Camera	720p HD with ThinkShutter privacy cover Optional: Hybrid Infrared (IR) with ThinkShutter	
Memory	Up to 128 GB DDR4 2666 MHz	Up to 128 GB DDR4 2666 MHz ECC (Xeon® processor)
Storage	Up to 2 TB PCIe SSD Up to 2 TB 5400 RPM	500 GB 7200 RPM Up to 6 TB support
RAID	0, 1, 5	
Battery	Up to 16.5 hours* on 90Wh, includes Rapid Charge technology** Up to 13 hours on a single one-hour charge	*Based on testing with MobileMark 2014. Battery life varies significantly with settings, usage, and other factors. **Requires 230W AC power adapter
Audio	Stereo speakers with Dolby Atmos® sound system Dual far-field mics	
Security	Discrete Trusted Platform Module (dTPM) 2.0 Fast Identity Online (FIDO) authentication capabilities Optional IR camera (for login with Windows Hello) Optional Match-on-Chip fingerprint reader	ThinkShutter webcam privacy cover Optional Smart card reader Kensington lock slot
Ports	2 x USB 3.1 Gen 1** (1 always on) 2 x USB 3.1 Gen 2 Type-C / Intel® Thunderbolt 3 (DisplayPort, Data transfer) 1 x USB 3.1 Gen 2 Type-C (DisplayPort, Data transfer) 4-in-1 media card reader (MMC, SD, SDHC, SDXC)	HDMI 2.0 RJ45 Ethernet Smart card reader (Optional) Audio combo jack
Connectivity	WLAN: Intel® AX200 Wi-Fi 6 802.11AX (2 x 2) + Bluetooth® 5.0 Optional WWAN: Fibocom L850-GL 4G LTE-A cat 9	
Keyboard	Spill resistant Precision Keyboard with numeric pad	Backlit with white LED lighting
Weight	Starting at 5.51 lbs (2.5 kg)	
Dimensions	377.4 x 252.3 x 24.5 (mm) / 14.85" x 9.93" x 0.96"	

Top ISVs

- Flame Resolve
- Maya 3Ds
- Premiere
- Unity
- Zbrush
- AVID
- Photoshop
- Unreal
- Nuke
- Cinema 4D
- Adobe CC
- Avid Media Composer

Ideal Use Cases

Perfect for film and VR game development, the ThinkPad P53 offers cutting edge performance thanks to the inclusion of a desktop-grade graphics card and a super bright HDR panel, all allowing for the creation of more realistic content.

EDGE OUT THE COMPETITION

With the unparalleled performance, reliability, and builds of Lenovo ThinkStation and ThinkPad workstations, you'll have all the tools to keep the show running. Whether you need an all-powerful tower or a cutting-edge mobile workstation, we have the solutions you need to get the job done—in 4k, 8k, and beyond. Bring your vision to life with Lenovo Workstations. To learn more about workstation offerings for the media and entertainment industry, please visit solutions.lenovo.com/workstations



ThinkStation P920



ThinkPad P1



ThinkPad P53



ThinkStation P520



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