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Lenovo Workstations for Media & Entertainment

Analysis of Foundry Nuke 16 performance on Lenovo ThinkStation P8 powered by AMD Ryzen™ Threadripper™ PRO 9000 WX-Series processors

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Sponsored by: Lenovo

JPR independently tested the Lenovo ThinkStation P8 workstation powered by multiple processors from AMD Ryzen™ Threadripper™ PRO 9000 WX-Series, to measure the performance impact they have on Foundry's Nuke 16 digital compositing software.

About Foundry Nuke

Foundry Nuke is a powerful node-based digital compositing and visual effects (VFX) application. It features a scalable node graph with over 200 tools, an integrated 3D environment, and deep compositing capabilities that allow artists to work with complex 3D scenes and high-resolution imagery. It is widely considered by studios of all sizes to be an industry-standard compositing toolset for high-end film, television, and animation production.

The Workflow Challenge

In high-end visual effects, the creative workflow demands a mix of interactivity with assets in the viewport and node mesh. Previewing progress requires frequent renders, whether at proxy settings for previews or full quality and full resolution for the final output. These workloads demand a balanced, and powerful, workstation, where the interactivity tasks need a handful of cores running at the highest possible frequency, while the render output of Nuke's export nodes (called Write Nodes) can use a high number of processing cores. Any shortfall in performance per core — a combination of frequency and instructions per clock (IPC) — or processor core count driving parallel processing capacity, will disrupt the user's creative flow, reducing the number of iterations within a given time and ultimately constraining quality of the final composition.

"You are never done; you just run out of time" — is a common saying among VFX and 3D artists.

A VFX compositor typically triggers 10 to 30 renders per day, ranging from quick local test renders (seconds to minutes) to high-resolution, high-quality renders, often submitting multiple iterations for daily reviews. Actual rendering time varies from quick test iterations to long overnight daily progress jobs for review, with the day heavily focused on feedback adjustments on individual frames and even sequences of different complexity levels!

The Solution

With a state-of-the-art workstation provided by Lenovo and all the AMD processors listed in Table 2, JPR independently tested Foundry Nuke's performance, using a real-world benchmark created by Nuke expert Xavier Bourque, known in the industry as Pixelfudger. Until now, Nuke users have tested their current (and often aging) hardware to compare their performance with their peers. This project was created by JPR to introduce the latest and most powerful AMD workstation processors into the mix and show users how much performance they would get by switching to newer and more powerful processors, empowering Nuke users and VFX studios to make informed decisions about their workstation purchases.

System Specifications

Figure 1. Lenovo ThinkStation P8 running Foundry Nuke 16

The following table details the system setup.

Workstation	Lenovo ThinkStation P8
Processor	See Table 2 of tested processors below
Memory	256 GB DDR5-5600 RDIMM 8-Channel in 9000WX Models 128 GB DDR5-4800 RDIMM 8-Channel in 7000WX Baseline Configuration
GPU	Nvidia RTX A6000
Storage	3x 2TB SSD M.2 2280 PCIe 4.0×4 Performance NVMe Opal

Table 1. Test workstation specifications

The range of processors used was extensive.

Processors	Model	Cores	Architecture	Max Turbo Freq	Base Clock
AMD Ryzen™ Threadripper™ PRO	9995WX	96	"Zen 5"	Up to 5.4 GHz	2.5 GHz
AMD Ryzen™ Threadripper™ PRO	9985WX	64	"Zen 5"	Up to 5.4 GHz	3.2 GHz
AMD Ryzen™ Threadripper™ PRO	9975WX	32	"Zen 5"	Up to 5.4 GHz	4.0 GHz
AMD Ryzen™ Threadripper™ PRO	9965WX	24	"Zen 5"	Up to 5.4 GHz	4.2 GHz
AMD Ryzen™ Threadripper™ PRO	9955WX	16	"Zen 5"	Up to 5.4 GHz	4.5 GHz
AMD Ryzen™ Threadripper™ PRO	7945WX	12	"Zen 4"	Up to 5.3 GHz	4.7 GHz

Table 2. AMD processors (CPUs) used for testing

For more information and specifications about the Lenovo ThinkStation P8, visit: https://psref.lenovo.com/Product/ThinkStation/ThinkStation_P8, or follow the QR code at the end of this report.

Key Productivity Drivers

We found the AMD Ryzen™ Threadripper™ PRO 9000 WX-Series processors to be ideal for accelerating Foundry Nuke, by bringing:

- **AMD "Zen 5" Architecture:** The higher instructions per clock (IPC) combined with turbo frequencies up to 5.4 GHz means that even legacy Nuke nodes will run significantly faster, providing snappier node-graph interactivity.
- **Massive Parallelism:** Beyond faster cores, AMD Ryzen™ Threadripper™ PRO 9000 WX-Series processors scale from 12 to 96 cores and can therefore handle the most demanding Nuke 16 projects, including 3D scenes, BlinkScript code, third-party Gizmos, and render locally and faster than any previous AMD processor generation.
- **Enhanced Memory Throughput:** AMD Ryzen™ Threadripper™ PRO 7000 WX-Series supports up to DDR5-5200 MT/s (DDR5-4800 was tested), and the Threadripper PRO 9000 WX-Series enables higher memory bandwidth, up to DDR5-6400 MT/s (DDR5-5600 was tested), that increases the data pipe for multi-channel EXRs, feeding Foundry Nuke's Scanline rendering faster than ever before.

- **Expansion without Compromises:** AMD Ryzen™ Threadripper™ PRO 9000 WX-Series has 128 PCIe Gen 5.0 lanes (and extra Gen 4.0 lanes) that provide support for multiple GPUs, for GPU-accelerated nodes, and enhance CopyCat training speed. Also, JPR was able to separate the storage subsystem into three solid-state drives (SSDs) to optimize read/write performance by separating: OS/Application, Nuke Cache, and Nuke temporary files' locations, with plenty of expansion left in the Lenovo ThinkStation P8 workstation.

The Cumulative Benefit of a Powerful CPU

Small, frequent operations add up. Based on JPR's tests of PxF Nukebench benchmark, a compositor moving from our baseline workstation based on AMD Ryzen™ Threadripper™ PRO 7945WX processor to the new 9000 WX-Series can see performance improvements between 34% and 152%, or 2.52× the baseline performance.

In order to see the Nuke project's progress and try effects iterations, a VFX compositor (aka, Nuke user) does around 30 preview renders on a typical day, and the productivity improvements from having a state-of-the-art workstation are significant. Considering the investments already done in a Nuke's license and the VFX compositor's salary, a powerful workstation is the scaling factor for a strong return on investment (ROI).

Although the AMD Ryzen™ Threadripper™ PRO 7000 WX-Series processors are powerful, the benefits of upgrading to newer and more powerful models of Ryzen™ Threadripper™ PRO 9000 WX-Series are clear. For example, the data shows that upgrading users' workstations to the PRO 9985WX processor 64-core results in estimated investment returns between $127 and $863 / week, from increased productivity as shown in Figure 2, below, depending on the project's complexity level. Calculation: Senior VFX artist hourly rate ($100) × time saved in renders.

In high-complexity projects, the cost of the CPU upgrade is recouped through productivity gains in just four to 20 weeks, depending on the model. This makes the upgrade decision a no-brainer. JPR's analysis uses the AMD Ryzen™ Threadripper™ PRO 7945WX processor as a baseline. This processor family is just one generation behind the 9000 WX-Series, and the upgrade value is clear. Any user relying on the 5000 WX-Series or older will see substantially higher benefits, making the upgrade even more justified.

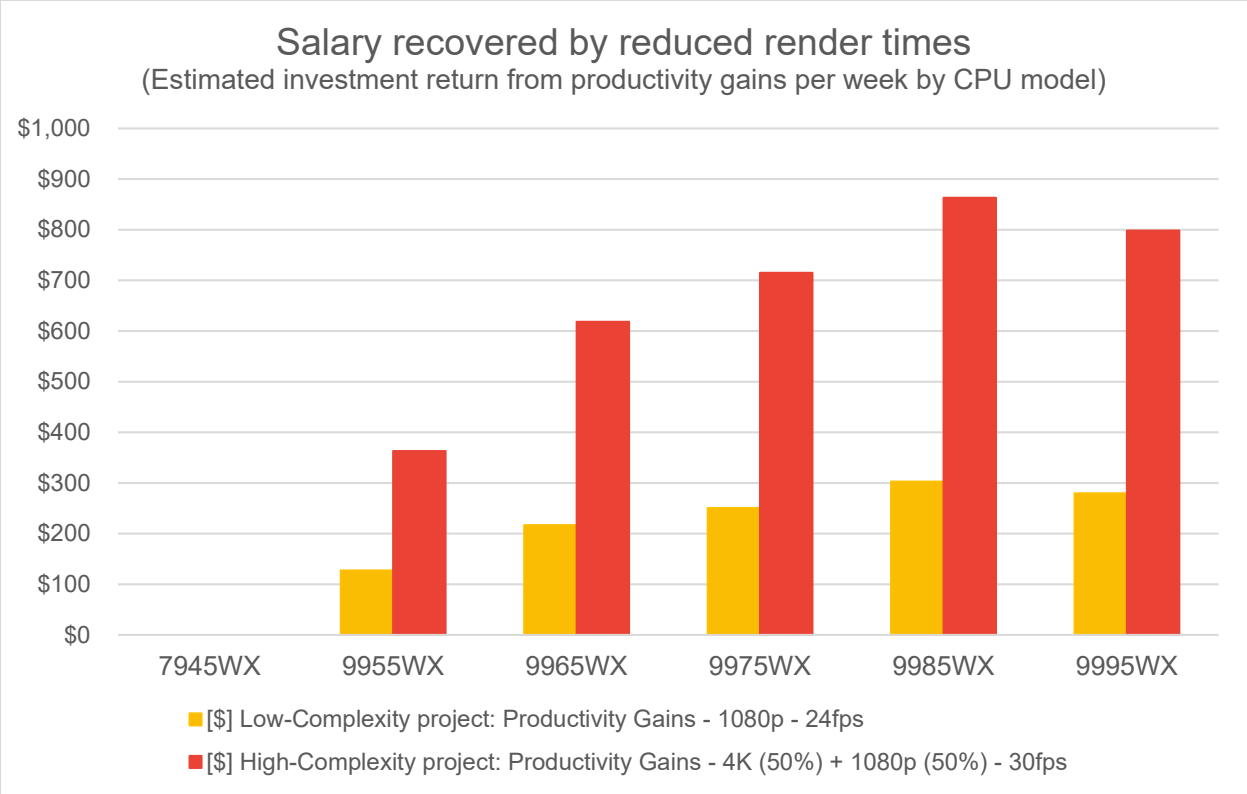

Figure 2. Estimated investment return from productivity gains per week by CPU model compared to AMD Ryzen™ Threadripper™ PRO 7945WX baseline

These gains also show that these CPU upgrades pay for themselves in a few months, while keeping users in the creative flow that enables them to iterate more and ultimately increase the final quality of the composition. Maintaining experts who are creating more and waiting less increases the ROI on their time and salary, while reducing the time needed to implement feedback, and preventing project delays due to slow renders. Figure 3 illustrates the estimated cost impact of users waiting for renders each week and the percentage of their 40-hour workweek it represents.

The slight roll-off from the 9985W 64-core to the 9995WX 96-core show that there is a point where operating system limitations require the Nuke user to set up advanced settings like Nuke Frame Server to fully use all available cores. More on this in the performance section below.

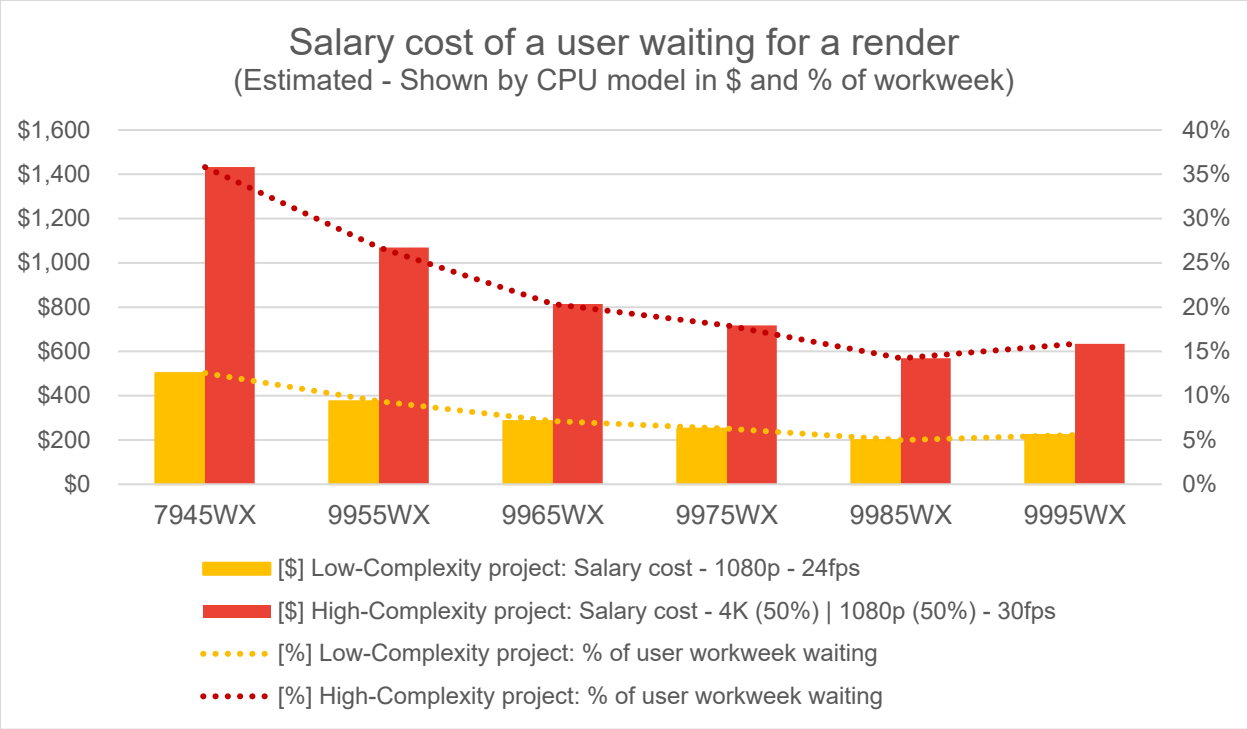

Figure 3. Estimated weekly cost from user's salary, waiting for a render by CPU Model

"While low-complexity projects or previews rendered at 1080p will see incremental benefits from using better processors, the more realistic scenario of a mix of higher-complexity (4K) and lower-complexity (1080p) renders shows that having powerful processors like the AMD Ryzen™ Threadripper™ PRO 9975WX or 9985WX goes from 'nice to have' to 'necessary.' Otherwise, the company will end up paying a higher cost in inefficiencies, like having a highly specialized compositor waiting for renders up to 40% of the time or sacrificing quality due to inadequate hardware." —Hernán Quijano – Workstation Analyst, Jon Peddie Research

AMD Ryzen™ Threadripper™ PRO 9985WX is not only the fastest processor tested in this project, but also the fastest result ever posted by the Nuke user community by the time of this writing (March 31, 2026). Each one of the 9000 WX-Series processors, from the 9955WX to the 9985WX, offers incremental performance while improving the percentage of time that a compositor is creating vs. waiting, when compared to the PRO 7945WX processor baseline.

The AMD Ryzen™ Threadripper™ PRO 9995WX offers comparable performance (slightly lower) vs. the PRO 9985WX processor, since Foundry Nuke uses up to 64 cores/threads by default on Microsoft Windows 11 Pro. This means that the PRO 9995WX processor still has 32 physical cores and 96 SMT cores fully available for multitasking while rendering. Also, Foundry Nuke can be configured with a Frame Server that launches multiple instances of Nuke—therefore, using all available cores—and Linux might also offer higher thread utilization. These approaches are beyond the scope and timeline of this project; we might investigate further in the future.

Performance

Thanks to all the technical features on the new AMD Ryzen™ Threadripper™ PRO 9000 WX-Series processors and the excellent workstation thermal design and systems engineering of the Lenovo ThinkStation P8, JPR's tests shattered all previously submitted processor performance results at each processor core count and model, from 12 to 96 cores.

To measure the impact on productivity of the new and more powerful AMD Ryzen™ Threadripper™ PRO 9000 WX-Series processors, JPR measured the performance of Foundry's Nuke by running PxF Nukebench, a benchmark developed by Nuke expert Xavier Bourque.

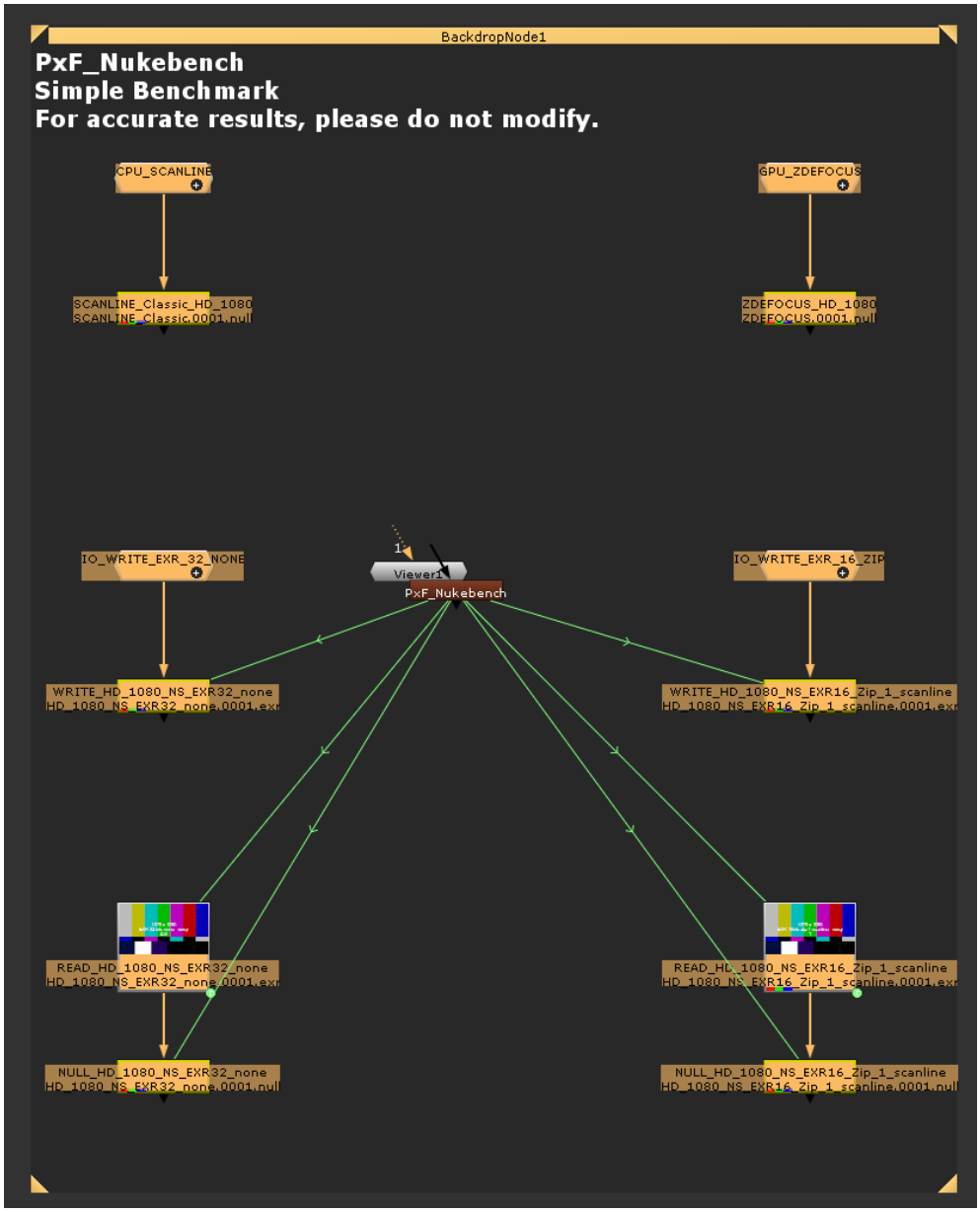

Figure 4. PxF Nukebench – node structure in Nuke 16

PxF Nukebench is designed to help users accurately measure and compare the performance of different workstations running Nuke. Whether for a freelancer testing a new machine, a company evaluating hardware for purchase, or a user optimizing their current setup, it provides concrete metrics to guide Nuke users. PxF Nukebench measures real-world workloads and runs inside Foundry Nuke. Results can be shared to a community spreadsheet to see how a specific machine ranks against others across the industry. For more information, visit the PxF Nukebench's website: https://pixelfudger.com/pxf-nukebench or follow the QR code at the end of this report.

Results

JPR's testing of Foundry Nuke resulted in the following PxF Nukebench's CPU scores:

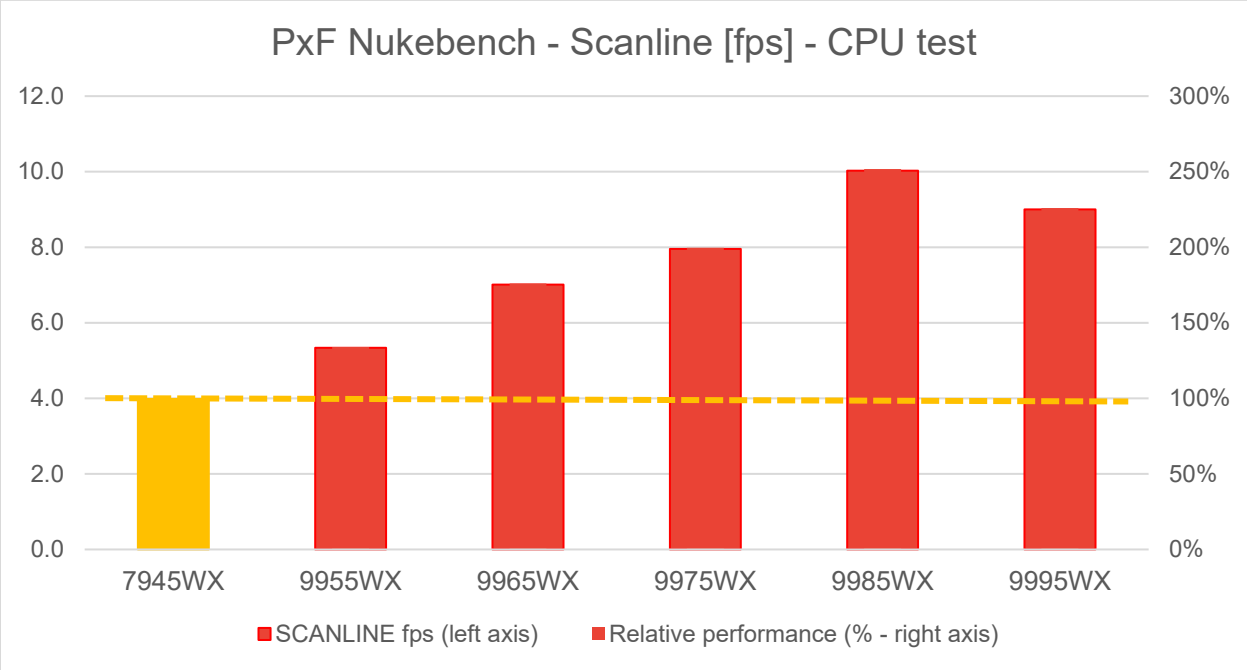

Figure 5. Test results using various AMD processors with Foundry's Nuke 16
Left axis: Exported frames per second (fps) – Right axis: Relative performance vs. 7945WX

Processor	AMD Ryzen™ Threadripper™ PRO WX-Series					
	7945WX	9955WX	9965WX	9975WX	9985WX	9995WX
	12 cores	16 cores	24 cores	32 cores	64 cores	96 cores
CPU - SCANLINE fps (Higher is better)	3.984	5.337	7.012	7.955	10.029	9.001
Relative performance	100%	134%	176%	200%	252%	226%

Table 3. Test results using various AMD processors with Foundry's Nuke 16

The performance improvements in the Lenovo ThinkStation P8, powered by AMD Ryzen™ Threadripper™ PRO 9000 WX-Series processors, are undeniable. When JPR started this project, the highest published score by a user was 7.076 fps, achieved on AMD Ryzen™ Threadripper™ PRO 7985WX 64-core processor. Now a comparable score can be achieved on AMD Ryzen™ Threadripper™ PRO 9965WX 24-core processor, while the 9985WX 64-core processor scores 43% higher at 10.029 fps, and there is room for an estimated 20% to 30% more performance if Nuke's Frame Server is used, as discussed previously, since this CPU has another 64 threads available thanks to simultaneous multithreading (SMT).

The AMD Ryzen™ Threadripper™ PRO 9995WX 96-core processor is only recommended if Nuke's Frame Server is the default setup for rendering; otherwise, users can expect performance 10% below the 9985WX 64-core processor, as shown in Table 3 above.

What is your PxF Nukebench score? There is no better way to make sense of all these performance numbers than comparing them to your current workstation scores. We encourage you to not only run PxF Nukebench, but also to submit the scores to the public database, as they play an important role in guiding the Nuke user community and helping them make better purchasing decisions.

Public Results Database

PxF Nukebench maintains a public performance database with the benchmark scores obtained by Nuke's user community. JPR submitted results for each of the CPU models tested, to serve as a reference for workstation purchasing decisions. The PxF Nukebench results database is available at the PxF Nukebench website: https://pixelfudger.com/pxf-nukebench

PxF Nukebench contains sub-tests to measure CPU, GPU, and storage speed. This report focuses on the CPU, testing multiple AMD Ryzen™ Threadripper™ PRO processors, while maintaining GPU and storage devices consistent.

Sample PxF Nukebench Result

After running PxF Nukebench, the user gets a detailed report with the results of all sub-tests. This text report can be submitted to be added to the public results database. We have added section titles to facilitate its interpretation:

```
Software Information
     NUKE: 16.0v8
     OS: Windows 11 Pro
Hardware Information
     RAM: 256
     GPU: NVIDIA RTX A6000
     CPU: AMD Ryzen Threadripper PRO 9985WX 64-Cores
```

```
      CORES: 64
      THREADS: 128
      FREQ GHz: 3.2
Processor (CPU) Score
      SCANLINE fps: 10.054
Graphics (GPU) Score
      ZDEFOCUS fps: 3.279
Storage Score (Write/Read Speed, Uncompressed/Compressed data)
      WRITE_HD_1080_NS_EXR32_none MB/s: 454.75
      WRITE_HD_1080_NS_EXR32_none fps: 19.149
      WRITE_HD_1080_NS_EXR16_Zip_1_scanline MB/s: 105.77
      WRITE_HD_1080_NS_EXR16_Zip_1_scanline fps: 17.612
      READ_HD_1080_NS_EXR32_none MB/s: 776.12
      READ_HD_1080_NS_EXR32_none fps: 32.683
      READ_HD_1080_NS_EXR16_Zip_1_scanline MB/s: 175.18
      READ_HD_1080_NS_EXR16_Zip_1_scanline fps: 29.169
Number of Rendered Frames
      CPU/GPU FRAMES: 500
      READ/WRITE FRAMES: 250
Data Reliability Verification
      CHECKSUM: 627411
```

Given that this report is analyzing multiple CPUs, the analysis focuses on the **Processor (CPU) Score: Scanline fps.**

PxF Nukebench – Processor (CPU) Scanline Render Test

The primary CPU performance test uses a scene with multiple cards rendered through a Scanline Render node at 1080p. This test is designed to push the processor to its limits. It is a highly parallel test, using many cores as it calculates the geometry and pixel data. Results are reported as exported frames per second (fps), allowing for a direct comparison of raw processing power.

In separate PxF Nukebench customized test (Advanced Mode), JPR tested 4K vs 1080p render times, resulting in 4K taking 3.57× render time vs. 1080p. Understanding the user workflow is critical, the more renders done at 4K resolution, higher node quantity or more complex nodes, the higher the need for newer and more powerful processors like AMD Ryzen™ Threadripper™ PRO 9000 WX-Series, according to the Figures 2, and 3, where the High-Complexity estimate assumes 50% of the renders done at 4K vs 1080p.

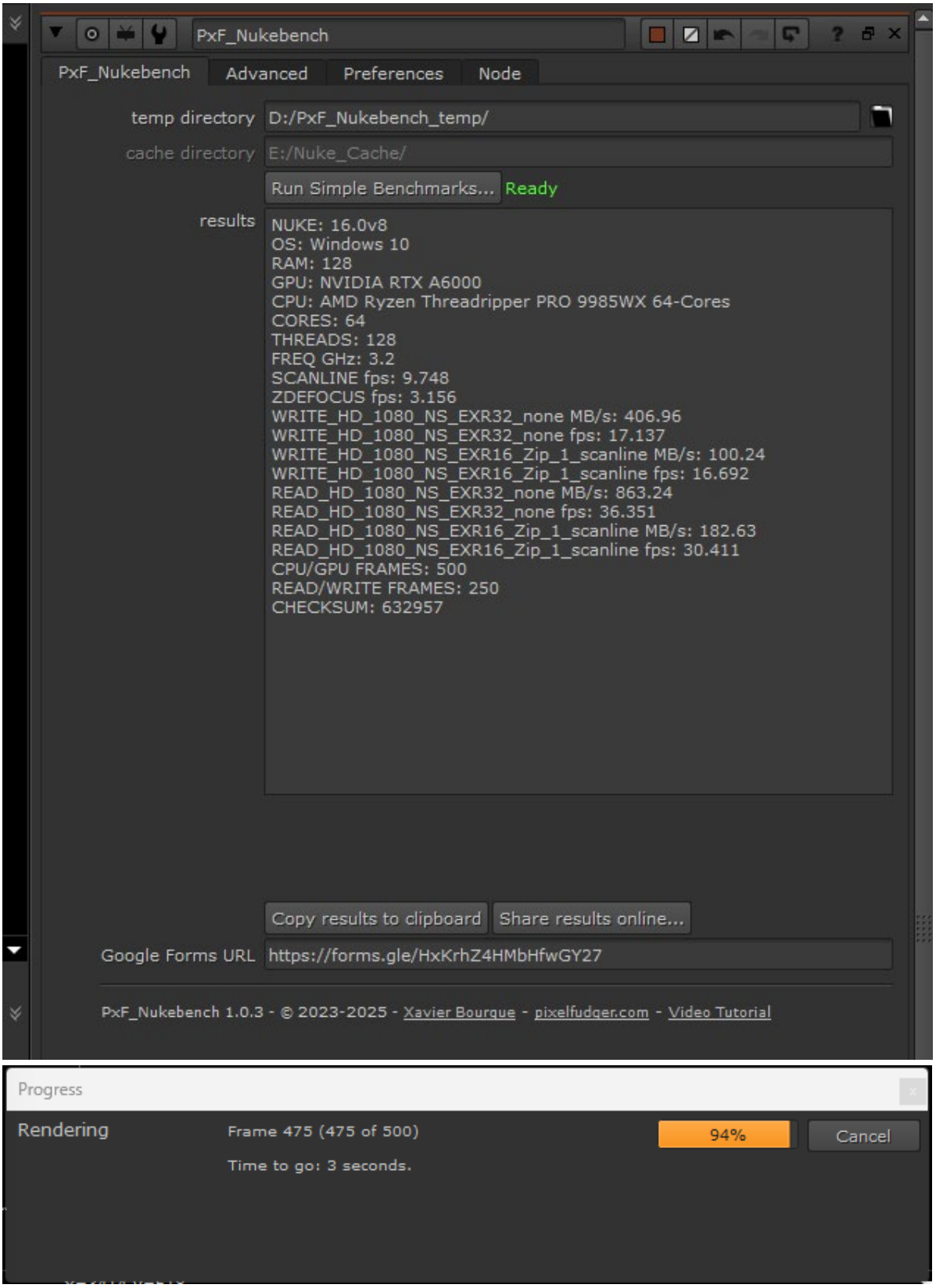

Figure 6. PxF Nukebench interface integrated into Nuke as a gizmo and rendering progress bar

Secondary Importance of the CPU

ZIP-compressed files affect the write and read speeds. Compression reduces the footprint on the project's storage, but it is particularly CPU-intensive because the processor must work hard to compress during write operations and decompress during read operations. This is another performance dimension that goes beyond the raw speed of the storage devices.

Software Details and System Preparation

- Application: Foundry Nuke 16.0v8 – Release Date: December 16, 2025
- Benchmark: Pixelfudger – PxF Nukebench v3.4v1 – Latest version available March 1, 2026
- Operating System: Microsoft Windows 11 Pro – Version 10.0.26200 Build 26200
- Windows Power Plan: Balanced
- Windows Update: All available updates installed
- Lenovo Vantage: All available system drivers and Lenovo updates installed

Testing Methodology

- Each Processor (CPU) model tested a minimum of three times for PxF Nukebench results. An extra run was done to capture the report of system resources utilization (SRU). Results of the SRU run were not used for performance calculations, only for verification of proper CPU behavior, including thermals, operating frequencies, and CPU % of utilization.
- The reported results on this project are the average of three runs.
- Maximum observed coefficient of variation (CV) between runs: 1.1%.
- Results submitted to PxF Nukebench public database are one of the three runs to assure data integrity via Checksum verification.
- Cooldown period: 1 minute cooldown between runs to let the system thermals stabilize after each run.
- Microsoft Windows' System Information report – Full report exported for all configurations for any future reference or clarification.
- A total of 65 total runs were performed during this project.

For more information and specifications about the Lenovo ThinkStation P8, visit:

Lenovo ThinkStation P8 - Specs

Link to: https://psref.lenovo.com/Product/ThinkStation/ThinkStation_P8

Lenovo Media & Entainment

Link to: https://techtoday.lenovo.com/us/en/workstations/media-entertainment

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pixelfudger.com/pxf-nukebench

Link to: https://pixelfudger.com/pxf-nukebench
