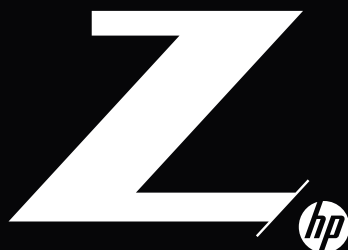# PUT
COMPUTING
POWER
WHERE DATA SCIENCE
RESEARCHERS NEED IT

Z /hp

DATA SCIENTISTS ROUTINELY HANDLE MASSIVE DATA LOADS

FOR PEAK PERFORMANCE, IT'S HARD TO BEAT A WELL-CONFIGURED LOCAL WORKSTATION

The cloud inarguably has changed the computing landscape, making storage and computer power widely available to enterprises and educational institutions. However, just as good carpenters don't use a hammer when a wrench is the right tool, relying on the cloud for every application would be a fundamental error. Often, in the sciences and particularly in academic research, there is no substitute for the power of a local workstation.

Although the cloud provides significant scale and flexibility advantages, it isn't always the right solution—particularly when computational power is a necessity. Cloud options always lag in terms of latency due to the distance and number of "hops" that data must travel to reach the computing resource.

Wise IT departments pay attention to what their people want. That's not only a matter of bragging rights; in scientific and data-centric circles, computing power is a requirement to get their work done. Nobody wants to wait on an elevator, a train… or a huge data computation.

Failing to keep faculty and researchers happy has downstream effects, as it is hard to retain top talent when they lack the technology they need. Tech failures may damage a research or academic institution's hard-won reputation.

By 2023, **57% OF DATA** will be captured and processed at the endpoint.[1]

64% OF END USERS say the technology they're given affects their productivity.[2]

56% say the technology their employer provides affects their willingness to stay long-term.[2]
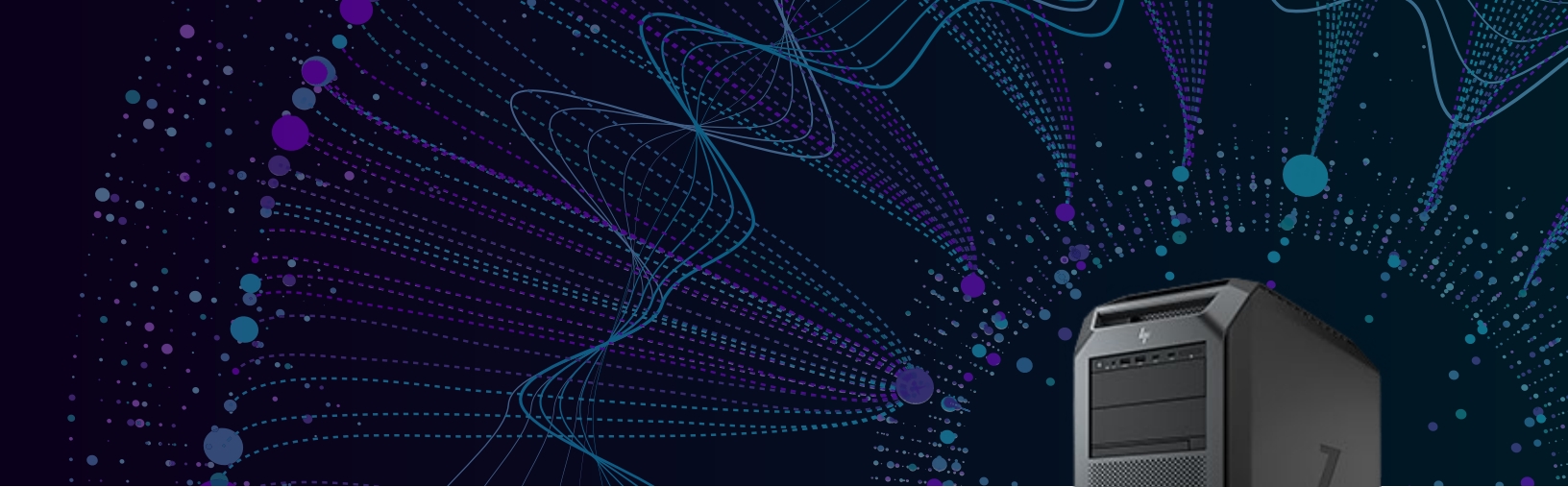
WHY WORKSTATIONS?

Workstations may be the right answer for your research labs. It's a matter of performance, reliability, and flexibility to adjust to the task at hand.
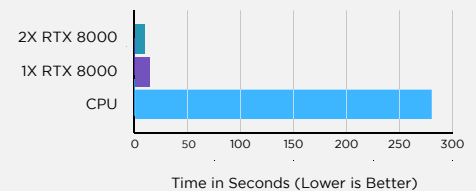
PERFORMANCE

Workstation buyers and the people who use them have tightly defined technical requirements. They need higher performance, to begin with. And they need more configurability from their computer systems, which must be optimized for rigorous workloads and the unique demands of faculty, researchers and students.

Typically, workstations take advantage of multiple server-grade CPUs with high core counts as well as powerful graphics cards. Those graphical processing units (GPUs) were initially designed to offload graphics processing from CPUs, and first gained prominence in gaming circles, but as these figures show, GPUs have also proven extremely useful for complex data science workloads.
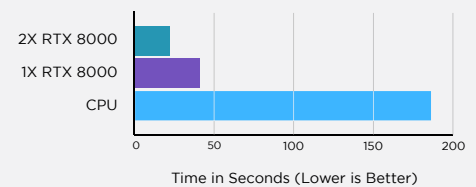
That level of performance helps data scientists manage big data projects and deliver insights faster. Time is money—and, when it comes to academic scientific inquiry, it also means faster results in fields that improve people's lives, from medical research to material science to sports analytics.

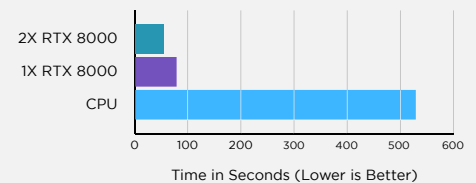## END-TO-END FASTER SPEEDS WITH RAPIDS ON NVIDIA® RTX 8000[3]

DATA PREP

2X RTX 8000	
1X RTX 8000	
CPU	

Time in Seconds (Lower is Better)
(0, 50, 100, 150, 200, 250, 300)

TRAINING

2X RTX 8000	
1X RTX 8000	
CPU	

Time in Seconds (Lower is Better)
(0, 50, 100, 150, 200)

END-TO-END

2X RTX 8000	
1X RTX 8000	
CPU	

Time in Seconds (Lower is Better)
(0, 100, 200, 300, 400, 500, 600)

End-to-end time = ETL + Conversion + Training + Validation. CPU Intel Xeon 6140 @ 3.2GHz, 3.7GHz Turbo, 384GB RAM, Ubuntu 16.04.4, NVIDIA driver 410.93. HP results may differ.

WORLD-CLASS RELIABILITY

Workstations are highly specialized, task-optimized computers. Given the demanding nature of capturing, cleaning, and processing data, these systems must meet high performance standards. After all, they have to support the workloads that data scientists put them through.

Our hardware is designed to withstand real-world workloads, and is tested to ensure it delivers on that promise. That reliability promise extends to the applications deployed on these systems, with software publisher certifications to ensure that the software operates at peak performance and can be managed and updated easily. In addition, workstations are further backed by layers of first-class US-based service.

PURPOSE-BUILT SOLUTIONS

Workstations are not mass-market products. These special-purpose computers are built for heavy-duty workloads, such as artificial intelligence, machine learning, and data science.

They are configurable because the features that enable today's data and research needs are certain to need more power in the next iteration. These workstations are designed to accommodate the high-performance requirements of tomorrow, with multiple multi-core server-grade processors, hundreds of gigabytes of fast, error-correcting memory, and terabytes of SSD storage.

And although the cloud looms large in data processing, some workloads run better locally. Real-time data capture and processing on the edge—where data is generated—lend themselves better to local workloads.

75% OF ENTERPRISE-GENERATED DATA will be created and processed outside data centers and the cloud by 2025.[4]

THE Z ADVANTAGE

Your researchers demand the power of high-performance computing at their fingertips, built for data scientists, certified and configured to work with the software they need to deliver insights faster.

ALL THAT IS AVAILABLE WITH Z BY HP WORKSTATIONS.

Z Workstations have unbridled analytic power. They can manage 5 billion rows of data in milliseconds—levels of performance backed by 360,000 hours of brutal testing on computation and graphic-heavy workflows. Our workstations are used for advanced data science applications like AI/ML, computer vision, and automation. Everything a researcher could need is built into the box; a preloaded data science software stack takes the complexity out of setup and maintenance. No IT intervention is needed.

But if you *do* need to work remotely, HP ZCentral Remote Boost[5] lets you harness the power of your workstation from any other device in any location, even collaborating with colleagues in real time.

Z Workstations come preloaded with a family of open-source software tools, including Ubuntu Linux, TensorFlow, Keras, PyTorch, XGBoost, RAPIDS, CUDA, cuML, cuDF, Git, Visual Studio Code, RStudio, and Docker. You save hours, if not days, of setup time.

SERIOUS WORK CALLS FOR SERIOUS COMPUTING POWER.
PULL COMPUTATION TO THE EDGE, WITH Z BY HP.

LEARN MORE: HP.COM/DATASCIENCE

[1] International Data Corp., Worldwide Global DataSphere Forecast, 2019-2023

[2] "The Importance of the PC in a Data-Centric World," International Data Corp. via Intel Corp, https://www.intel.com/content/www/us/en/business/enterprise-computers/resources/importance-of-pc-data-centric-world.html

[3] https://www.nvidia.com/en-us/deep-learning-ai/solutions/data-science/workstations/

[4] Gartner, "What Edge Computing Means for Infrastructure and Operations Leaders," https://www.gartner.com/smarterwithgartner/what-edge-computing-means-for-infrastructure-and-operations-leaders

[5] HP ZCentral Remote Boost Sender does not come preinstalled on Z Workstations but can be downloaded and run on all Z desktop and laptops without license purchase. With non-Z sender devices, purchase of perpetual individual license or perpetual floating license per simultaneously executing versions and purchase of ZCentral Remote Boost Software Support is required. ZCentral Remote Boost Sender for non-Z Hardware requires a license and Windows 10, RHEL/CentOS (7 or 8), or UBUNTU 18.04 or 20.04 LTS operating systems. macOS (10.14 or newer) operating system and ThinPro 7.2 are only supported on the receiver side. Requires network access. The software is available for download at hp.com/ZCentralRemoteBoost.

4AA8-0548EEW, October 2021