

# Keeping Up With the Speed of Thought

With a Micron® 9100 PCIe® SSD, the Salk Institute for Biological Studies Has Reliable Access to All the Data it Collects During Experiments — for Years to Come



For the research institutes that are changing the world, capturing complete data quickly — and having confidence that the numbers will be accessible

when needed later — is essential. Experiments can't always be re-created, and lost data could mean a lost opportunity to find a cure or solve a crisis.

On the other hand, these nonprofits often lack the funds for the newest, high-end, secure data storage systems, leaving them with equipment that struggles to keep up. They have to be certain that when they buy equipment, they're getting real, long-term benefits from it.

This was certainly the case for Jorge Aldana, system analyst with the Salk Institute for Biological Studies in La Jolla, California. One of the world's pre-eminent basic research institutions, the Salk Institute explores the very foundations of life, seeking new realities in neuroscience, genetics, immunology and more. The institute, founded in 1960 by polio vaccine pioneer Dr. Jonas Salk, has nearly 1500 employees, with 250 working in the Computational Neurobiology Department. Aldana is one of four IT professionals who maintains more than 200 devices for that department.

"Data is huge for us," he says. "A lot of the people here analyze data, and they gather data streams from experiments — a lot of data. They have these little electrodes with multiple channels of data, and they dump all of that onto a hard drive.

"So storage is one of our main concentrations, because you can't lose data here."

Modern electrodes for neural research record up to 384 channels of information simultaneously to measure action potentials in neurons, up from the two or 16 channels the institute used to use during electrophysiology experiments. The length of experiments has also increased as researchers gather more information.

But researchers aren't just grabbing more, they're also doing it faster—as much as 15 GB/min at 384 channels. The institute relies on a metafile server with a petabyte of storage and a second tier file server, with tape backups. The slower hard drives in the main server struggle to keep up with the speed of the data, which can result in small packets of information getting missed — leading to incomplete data.

The dream, Aldana says, is to get a PCIe drive with more than a terabyte of space, which would not only be fast but would also take up very little space, something the institute doesn't have much of. But it just doesn't have the funds for that, and it's hard to justify the expense until they know for sure that the faster speeds from the PCIe would really make a difference in their environment, which already includes SAS and SATA SSDs.

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JORGE ALDANA  
System Analyst

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## Small But Mighty

Luckily for Aldana, he was given a Micron 9100 PCIe NVMe™ SSD to test. Micron's 9100 NVMe PCIe SSD has an interface that minimizes latency and provides consistently fast throughput up to 3 GB/s. This brings its data processing closer to the server than other storage media.

Aldana received the 1.6TB HHL SSD, which he installed in an Intel® Server S2600CW workstation. "That's the key with the PCIe product line," he says. "You can just stick a card in the machine, and it's done. It's so easy. And you can move on to other things."

Aldana benchmarked the Micron 9100 against several different drives, all on the S2600CW workstation running Ubuntu® v16.04, and the 9100 came out on top; across every test, the 9100 performed better and indicated it would catch all the data without missing a beat.

"The key thing is the speed," Aldana says. "I'm able to do things faster. I have an SSD in my system that could compete a little bit with it, but the PCIe SSD was obviously faster."

## A Real Benefit for Gathering Data

The results were conclusive, Aldana says. "We were able to say, yes, this is faster than the SSDs we're using. And it gives us the reliability we need in a small package."

Micron's eXtended Performance and Enhanced Reliability Technology (XPert) keeps the drive going reliably with data and power-loss protection and adaptive thermal monitoring.

While some in research institutes might question whether the drive is worth the price, once they see the speed and performance, they'll no longer doubt it's worth the investment, Aldana says.

"We need the speed to get all the data we're grabbing. I know other people are doing similar research, and they would love to know they can buy this SSD and it'll gather their data in a timely manner without missing or dropping data."

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## Fast Facts

- » **Organization:** Salk Institute for Biological Studies
- » **Industry:** Education
- » **Employees:** Nearly 1500
- » **Challenges:** Finding fast, reliable storage that can keep up the speed of their research.
- » **Solution:** Micron's 9100 PCIe NVMe SSD designed to meet the need of today's cloud computing environments. As benchmarked against several different drives on one of the institute's workstations, the 9100 came out on top across every test.
- » **What Made the Difference:** The NVMe protocol interface brings data processing closer to the server, minimizing latency and providing consistently fast throughput. Micron's XPert features keep the drive going reliably with data and power-loss protection and adaptive thermal monitoring.

## The Micron 9100 PCIe NVMe SSD

The Micron 9100 PCIe NVMe SSD has the speed and endurance required for today's cloud computing environments. Its NVMe protocol interface brings data processing closer to the server than other storage protocols, minimizing latency and providing consistently fast throughput up to 3 GB/s.

Available in HHL PCIe add-in cards and hot-swappable 2.5-inch U.2 form factors, the Micron 9100 has specific configurations for either read-centric (9100 PRO) or mixed-use (9100 MAX) workloads. It comes in a variety of capacities from 800GB up to 3.2TB to meet multiple budget and storage needs.

Learn more at [micron.com](http://micron.com).