



UF UNIVERSITY of FLORIDA

# Pushing the boundaries of human knowledge.

How the **University of Florida** used Lenovo ThinkSystem SR645 servers, powered by AMD EPYC™ 7002 and 7003 series family processors, to extend its HiPerGator supercomputer, supporting pioneering research across all disciplines.

Lenovo Infrastructure Solutions  
for The Data-Centered

HiPerGator

Lenovo

1

## Background

The University of Florida (UF) is one of the leading public research universities in the United States. With 16 colleges and 200 research centers and institutes, UF delivers more than 300 undergraduate and graduate courses to a community of 52,000 students.

One of the country's leading research universities, UF faculty conduct nearly \$1 billion in research annually. Research at UF plays a significant role in advancing our fundamental understanding of the world in which we live: generating creative breakthroughs that lead to new technologies, promoting economic growth in Florida, and changing the trajectory of young people through education.

2

## Challenge

High-performance computing (HPC) has become an essential tool in generating insights from large, complex data sets and driving new breakthroughs.

Since 2013, UF has supported thousands of research programs across multiple disciplines with its HiPerGator supercomputer. Each new year brings larger-scale research projects with corresponding increases in compute and storage demands. At the same time, demand from non-traditional HPC disciplines, such as the social sciences and humanities, continues to grow.

To meet the evolving needs of faculty and students, UF Information Technology's (UFIT) Research Computing department looked to significantly expand the HiPerGator system.



## **Why Lenovo and AMD? Cutting-edge HPC technology powered by next-generation AMD processors.**

UFIT Research Computing launched an open, competitive invitation to negotiate (ITN) process and selected Lenovo as its strategic partner to extend its cluster with Lenovo ThinkSystem SR645 servers, powered by AMD EPYC 7002 and 7003 series family processors.

Dr. Deumens comments: “The Lenovo team was very knowledgeable and responsive to our business needs and requirements. It’s important that our researchers have the latest technology. Lenovo’s AMD-based ThinkSystem servers have more RAM per core, which is critical to our researchers’ data-intensive applications that require more memory.”

Specifically optimized to run demanding analytics and AI workloads, the AMD EPYC processors also have built-in security features to help protect against data integrity and firmware issues.

The logo for HiPerGator, featuring the word 'HiPerGator' in a stylized, orange and blue font. The background is a dark blue with a network of white lines and dots, similar to the University of Florida logo background.

**HiPerGator**



“Lenovo’s proposed solution powered by AMD EPYC processors offered the perfect combination of power, speed, and availability.”

**Dr. Erik Deumens**

Director of Research Computing, University of Florida

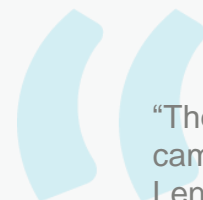
## Giving HiPerGator a new lease on life.

UFIT Research Computing worked closely with Lenovo Services to install the expansion, known as HiPerGator 3.0, in two phases.

Phase 1 of the expansion added 240 Lenovo ThinkSystem SR645 servers with 30,720 AMD EPYC 7702 series processor cores to the system, in addition to six Lenovo ThinkSystem SR645 large-memory nodes. Phase 2 added a further 150 Lenovo ThinkSystem SR645 servers featuring 9,600 AMD EPYC 7703 series processor cores.

With a total of 40,320 cores and 322 TB of RAM, the Lenovo expansion is connected to the wider HiPerGator cluster via Mellanox InfiniBand HDR fabric. Various storage systems, including 2.5 PB of all-flash, of common storage is accessible by all nodes. The HiPerGator cluster runs Red Hat Enterprise Linux with SLURM Workload Manager for job scheduling.

“Go-live was a non-event—just the way we like it,” says Dr. Deumens. “We switched on the HiPerGator 3.0 expansion during a scheduled maintenance window, so no extra downtime was needed, and the workload scheduler began assigning jobs to the new nodes immediately.”



“The installation went very smoothly. The equipment came fully assembled straight from the factory, and the Lenovo team was on-site to help us get everything set up. When we ran into a minor issue with the cable lengths, we were very impressed by how quickly Lenovo resolved it for us.”

**Dr. Erik Deumens**

Director of Research Computing, University of Florida

3

## Results

Today, the HiPerGator supercomputer supports more than 3,000 users across 400 research groups. Researchers can take advantage of the huge increase in processing power to run more jobs faster, shortening time-to-insight and making new breakthroughs more likely.

Dr. Deumens comments: “World-class research requires world-class HPC resources. That’s exactly what the Lenovo ThinkSystem SR645 servers and AMD EPYC processors deliver.”

HiPerGator 3.0 is also helping to broaden the application of HPC to use cases outside of the traditional areas of science, technology, engineering, and mathematics (STEM)—in social sciences, humanities, and linguistics, for example. “The HiPerGator 3.0 expansion is part of our ongoing drive to democratize HPC, to make it more accessible to faculty and students across the university,” says Dr. Deumens.

Today, the new and improved HiPerGator supercomputer is being used to run 1,400 different applications on everything from gene sequencing, engineering design and research, physics, materials engineering, social sciences, natural language processing, and more.

Adopting the Lenovo ThinkSystem SR645 servers powered by AMD EPYC processors will allow UFIT Research Computing to retire some of the older HiPerGator hardware, which is reaching end-of life, and gradually add new capacity to meet ever-increasing demand.



✓ 40,320 AMD EPYC  
compute cores

✓ 3,000 users across  
400 research groups

✓ 1,400 applications



“With Lenovo and AMD technology powering the latest expansion of our supercomputer, we have a HPC cluster that matches our research ambitions.”

**Dr. Erik Deumens**

Director of Research Computing, University of Florida

## What will you do with Lenovo HPC solutions?

The Data-Centered support pioneering research with  
Lenovo smarter infrastructure solutions, powered by AMD.

[Explore Lenovo HPC Solutions](#)



Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo.

AMD, the AMD logo, EPYC, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

Other company, product and service names may be trademarks or service marks of others.

© Lenovo 2021. All rights reserved.