LIQID

Higher Education
Solution Brief

Liqid Software-Defined Composable Infrastructure solutions enable IT organizations to achieve 100% GPU utilization, delivering the highest performance, flexibility, and efficiency.

» **Accelerate** time to production and meet exacting AI and HPC research demands in real time.

» **Improve** department and team agility, quickly accommodating changing workloads' needs.

» **Increase** efficiency by reducing datacenter costs and extending the life of existing investments.

Research and Learning Without Limits

Composable Infrastructure in Higher Education

Academic institutions lead the way in discovering next-generation emerging technologies, accelerated computing, data science, and AI.

With limited budgets, higher education institutions must balance the demand for high-performance computing infrastructure with scarce resources. Liqid Software-Defined Composable Infrastructure delivers flexibility and performance to enable discoveries without limits.

Benefits

Composable infrastructure enables universities to achieve higher performance by providing a flexible, scalable, and efficient way to manage and allocate computing resources, specifically GPUs, dynamically. By embracing composable infrastructure, universities can maximize resource efficiency, accelerate groundbreaking research, and provide their faculty and students with unparalleled computational capabilities—all while keeping costs under control.

Flexibility

Researchers and faculty can spin up or tear down environments quickly, fostering agility in academic and research projects. IT teams can easily provision and manage resources for diverse research initiatives, streamlining operations and enhancing collaboration efficiency.

Performance

By directly connecting resources over high-speed fabric networks, composable systems reduce latency and increase throughput, crucial for tasks like deep learning, genomic sequencing, and climate simulations. As research demands increase, composable infrastructure allows universities to scale up by simply adding new hardware to the pool, eliminating the need for disruptive infrastructure overhauls.

Efficiency

Instead of over-provisioning or underutilizing hardware, resources are optimized across multiple departments and projects, reducing waste and maximizing ROI. Researchers can easily reconfigure and test new setups without needing dedicated hardware, accelerating the pace of discovery and innovation.

Use Cases

Research and Simulations

Enable simulations and analysis in physics, chemistry, biology, and other fields that require massive computational power pooled and shared across research teams. Examples include:

- Climate Modeling: Simulating global climate patterns to study environmental changes.
- Genomic Sequencing: Accelerating research in genetics and personalized medicine.

Big Data Analysis

Analyze enormous datasets across disciplines leveraging GPU-dense computational power for:

- Social Science: Processing largescale surveys or social media data for trends and behavioral insights.
- Healthcare Studies: Analyzing medical records for virus and disease trends and drug efficacy.

AI / ML

Training complex AI and ML models in academic applications.

- Natural Language Processing: Research in linguistics and automated translation.
- Autonomous Systems: Developing and testing algorithms for robotics and autonomous vehicles.
- Education Tools: Improving adaptive learning systems through real-time data analysis.

Advanced Engineering & Design

Support detailed simulations and optimizations in engineering, such as:

- Aerodynamics: Designing and testing aircraft or automotive systems.
- Materials Science: Simulating molecular structures for new materials or drug development.
- Energy Systems: Modeling renewable energy grids and optimizing power distribution.

Education and Training

Enhance teaching and skill development through:

- Virtual Labs: Offering students access to computational resources for experiments.
- Courses in computational sciences: Hands-on experience with HPC platforms for future professionals.
- Interdisciplinary Learning: Healthcare Studies: Providing tools for collaboration in computational biology, data science, and digital humanities.

Generative AI

Accelerate the work of researchers who are revolutionizing higher education.

- Research and publication through text, images, sounds, animations, 3D models and code content creation, and collaboration across various academic areas of study.

Higher Education and Customer Research Examples

University of Gronigen, The Netherlands

University of Groningen improved its data centre infrastructure to better support its scientists and accelerate breakthrough innovations. The university deployed Liqid and Dell PowerEdge servers to deliver a scalable, flexible and state-of-the-art infrastructure data centre system that can accommodate a wide variety of data-intensive AI, HPC and scientific research applications. Read Case Study

Durham University, United Kingdom

Durham's COSMA8 is helping scientists tackle some of humankind's biggest questions using large-scale simulations. While all simulations running on COSMA8 have high memory demands, some workloads require GPU acceleration. Since GPUs can be among the most expensive resources in an environment, it's important to ensure utilization is maximized. With Liqid, Durham improves resource utilization and reduces the university's carbon footprint. Read Case Study

University of Illinois Chicago (UIC), United States

An internationally renowned interdisciplinary research laboratory established in 1973, UIC's Electronic Visualization Laboratory (EVL) specializes in research, development, deployment, technology transfer and training in visual data science – with a focus on high-performance visualization and collaboration environments, visual analytics, virtual reality, and advanced computing and networking cyberinfrastructure. UIC utilizes Liqid composable infrastructure to pool and share the computer's components (traditional processors, GPUs, storage, and networking) so that different applications with different workflows can be run simultaneously, with each configuring the resources it requires almost instantaneously, at any time. Read Case Study