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Professor Pankaj Sah, Director, Queensland Brain Institute,  
University of Queensland



## CASE STUDY

# Queensland Brain Institute Speeds Vital Research With Hitachi Vantara Solution

**Challenge:** Keep pace with ever-increasing data density requirements driven by scientific advances.

**Solution:** Data center modernization supports ground-breaking scientific research with Hitachi hybrid flash storage and Brocade Fibre Channel networking to meet research computing requirements.

**Outcome:** Technology partners with science to enable pioneering scientific research.

### The Challenge

Queensland Brain Institute (QBI) researchers at the University of Queensland investigate, study and strive to understand the fundamental mechanisms that regulate brain function. They are working to determine why people suffer from conditions such as depression, anxiety, schizophrenia, motor neuron disease and Alzheimer’s. And they seek to develop treatments that could improve the lives of those living with conditions that affect the brain and nervous system. QBI’s activities range from basic biology to genomics, complex imaging, electrophysiology and super-resolution microscopy. These involve the capture, indexing, storing, sharing and archiving of a tremendous amount of data.

“We have one particular device producing 7TB of data an hour. One experiment produces 500TB a day. That’s a half a petabyte per day just for one simulation,” said University of Queensland

Associate Director of Institutes Research Computing, Jake Carroll.

QBI’s challenge is not simply to deal with current data management requirements, or even to handle the management of and access to the 22PB of unstructured research data collected over the years. Neuroscience is growing quickly, driven by advancements in technology, yielding more data for analysis. QBI’s data density requirements are increasing to keep up with these advancements. In addition, modern data analysis can be used to revisit archived brain images for new insights. With hundreds of researchers running simultaneous simulations, a comprehensive and high-performance storage platform and powerful Fibre Channel network is required for retention, discoverability and data-driven insight: a core to the computationally intensive research mission.

To accomplish this, the University of Queensland required committed



**THE UNIVERSITY  
OF QUEENSLAND**  
AUSTRALIA

### INDUSTRY

Health: Neuroscience Research

### SOLUTIONS

Storage, Hybrid Flash, Data Management

### HARDWARE

Hitachi Unified Storage VM systems (some with Hitachi Accelerated Flash)

Hitachi Virtual Storage Platform G200 systems (some using solid-state drives)

Brocade G620, 32Gb/sec Gen 6 Fibre Channel switches

### Outcomes

- High-speed data transfer from instruments to storage, for supercomputing and analysis.
- Improved data management, accessibility and cross-platform data sharing.
- Improved ability to conduct valuable research, publish and compete for funding.

technology partners, a spirit of co-creation and the technology to underpin the research with extreme capability.

“We are facing an ongoing battle between scientific instruments and data storage capability. Scientific instruments are ever evolving, improving and creating tremendous amounts of data. Part of my job is to ensure QBI’s technology and infrastructure works as fast as it can to make science go as fast as it can, so that we can achieve a better time to discovery.”

Jake Carroll  
Associate Director of Institutes  
Research Computing  
University of Queensland

## The Solution

The University of Queensland has had a longstanding relationship with Hitachi Vantara and SureBridge. Since the Queensland Brain Institute was established in 2004, QBI has consistently supported its researchers with Hitachi Vantara storage arrays, and Brocade, a Broadcom Inc. company, delivered the right technology mix to meet QBI’s increasing data management requirements.

“We’ve got Hitachi Vantara storage in place as our big core workload beasts that sit in the corner, tick away and deal with everything. We’re using Hitachi hybrid storage with flash for more interesting point workloads for scientific capture, to accelerate the workloads and metadata for our largest file systems. Over the past 15 years, Hitachi has been there to keep up with our requirements every time,” said Carroll.

In conjunction with Hitachi Vantara, QBI implemented a mix of 16Gb and 32Gb Fibre Channel networking on Brocade G620 series Fibre Channel switches from Broadcom to solve critical bandwidth and throughput requirements. This switching infrastructure is the backbone for transport between the Hitachi arrays and tape libraries. In total, the solution supports a data lake of over 22PB.

## The Benefits

“We are able to derive extremely low latency and extremely high throughput through the newest generation Brocade Fibre Channel technology. We can literally get double the throughput out of every port,” said Carroll.

University researchers can capture data from instruments and transfer it to storage much more quickly, which is vital for this institution to remain competitive and achieve a faster time to discovery. Once the data hits primary storage, then the real work happens and users can supercompute against and analyze that data. That’s been the most tangible outcome, according to QBI’s director.

“The better the technology, the better, more detailed, more wide-ranging and more interesting questions we can ask of the data we capture. Before this implementation, there were studies we wanted to undertake that were too difficult, or we just didn’t have the infrastructure to support them. Now we just go ahead and do it,” said Professor Pankaj Sah, Director at Queensland Brain Institute, University of Queensland.

“A clinical study collecting, transferring and analyzing data on 10 patients used to take around six months. Now we can realistically do that in a week. The kinds of experiments that are being done, the kinds of publications that are being produced and the types of people we collaborate with have changed completely. It’s been a win for us. All that enhances our ability to get grants,” said Sah.

Carroll attributes the successes of this stage of QBI’s ongoing data management journey

to the commitment from its technology partners and their willingness to explore the edges and boundaries of neuroscientific research computing.

“Together, QBI, Hitachi Vantara and Brocade by Broadcom are pioneering in co-creation in the ability to take research and turn it into something real,” concluded Carroll.

## About Broadcom

Broadcom Inc. is a global infrastructure technology leader built on 50 years of innovation, collaboration and engineering excellence. Brocade, a Broadcom Inc. company, partners with the world’s leading server and storage vendors to deliver the nonstop availability and exceptional performance required for modern data centers.

## About SureBridge

SureBridge IT has 25 years’ experience delivering tailored solutions and expertise to small and medium-sized businesses and government organizations throughout Queensland and beyond. Helping clients achieve their business goals by providing smart, flexible IT solutions that mitigate risk, enhance their business operations and enable growth for the long term.

## About Hitachi Vantara

The key to new revenue streams, better customer experiences and lower business costs is in your data. Hitachi Vantara merges operational and informational experience to elevate your innovation advantage in data and deliver meaningful outcomes. The world is changing the way we work. We’re changing the way the world works.

## Hitachi Vantara

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