HITACHI
Inspire the Next

Customer:	Intersect Australia
Industry:	Research and Science
Region:	New South Wales
Products & Services:	File and Content, Cloud
Solutions By:	Hitachi Vantara

Hitachi Vantara Fosters Scientific Innovation With Intersect Australia

Through the partnership with Hitachi Vantara (formerly known as Hitachi Data Systems), Intersect is able to facilitate research collaboration in areas as vital and diverse as medical research, astrophysics, environmental modelling and monitoring, cultural heritage protection, and many others.

Research data hosted on the Intersect facility is accessible through a secure multitenant content cloud that enables file sharing, databases and applications via a virtual portal on a Hitachi storage system.

The facility is tightly integrated with Intersect's large-scale computing platforms, allowing Intersect to provide a world leading, unified service that supports its members' diverse research activities. It is also connected via a dedicated, high-speed network through AARNet to Australia's research infrastructure making possible effective and efficient national and international collaboration.

Intersect CEO, Dr. Ian Gibson, said: "The Intersect facility allows leading research institutions such as the Westmead Millennium Institute, which houses the Australian Breast Cancer Tissue Bank, to solve big data problems that involve geographically dispersed clinicians and research teams. The reliability, robustness and scale out capabilities of the Hitachi Vantara infrastructure let us provide an ideal platform of high value services to research groups. This makes it possible for our researchers to securely store and share their data with collaborating partners, and to meet their various legislative and compliance requirements."

He added, "Hitachi Vantara and Intersect share a commitment and dedication to R&D and innovation. We are honoured to receive the Health and Life Sciences Innovation Award in recognition of the benefits that data driven research can bring to society as a whole."

Benefits at a Glance
- Stores vast amounts of research data.
- Securely manages scientific data across academic disciplines.
- Delivers fast and reliable access to scientists all around the world.

> *We need to provide a high-bandwidth environment and error-recovery with self-repairing software that ensures no loss of data and a very low file-corruption rate. Hitachi provided us with those software features and we are now able to manage vast amounts of scientific information.*
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> Dr. Ian Gibson, CEO, Intersect

Intersect Australia

Intersect is Australia's largest full-service eResearch support agency. Located in Sydney, Australia, they aim to help solve some of the biggest questions in the world of science, including how the universe started, finding a cure for cancer, and mapping climate change. Intersect works with the research sector to identify, develop and deliver world-class ICT enabled platforms to drive the next generation of research and innovation. Intersect provides cost effective information infrastructure, data storage, high performance computing, software development, training and expert consulting services for its 11 university members, affiliated members (the Office of Environment and Heritage, the Sax Institute, Sirca and CSIRO) and for non-members.

The new research data storage facility serves as a cloud archive, storage and collaboration portal for data-driven research projects in Australia and around the world. With more than 30 projects already live, Intersect enables new research methodologies and collaborations with the help of an integrated Hitachi infrastructure and content management solution.

Intersect CEO, Dr Ian Gibson

The Challenge
Consolidating Australia's research data

Intersect Australia, Australia's largest research IT support agency, has built a name for itself providing services for New South Wales' extensive, world-leading university sector. However, in order to get to the next stage, Intersect needed an infrastructure platform that could enable researchers to undertake a variety of analyses. The platform needed to support processing and storage of vast amounts of data, as well as enable quick and efficient collaboration across the world. The reality of much scientific data is that findings are stored on disparate university servers, making data vulnerable to being lost and inaccessible to other researchers focusing on related problems. Intersect set a goal to create a next-generation research platform, specifically designed for data-driven research and collaboration, with virtually no limits to the size of its facility.

When Intersect secured funding from the Federal Government's Research Data Storage Infrastructure (RDSI) project, it kick-started the process of building a New South Wales (NSW) node. The NSW node connects scientists across Australia and the world.

"Australia is amongst those who lead the world in per capita investment in data science infrastructure," said Intersect CEO Dr Ian Gibson. "The need for innovation and expansion, given that data science is becoming more central to research, is increasing. In searching for the right provider, we were looking for a complete solution that enabled us to scale out infinitely," he explained. "The technology platform had to provide storage capacity that would meet the needs of managing hundreds of different types of data."

In addition, Intersect needed to create a platform that could store data intelligently and make it accessible for teams of researchers so they could share data and progress their scientific studies without technical restraints. After a rigorous tendering process, Intersect selected Hitachi Data Systems, because of the robustness, flexibility and ease of management of the solution.

The Solution
Choose Hitachi for stability, safety and scalability

Hitachi Data Systems delivered a single, fully integrated platform, comprising its Hitachi NAS Platform (HNAS), Hitachi Content Platform (HCP), Hitachi Unified Storage (HUS), and tape. The solution supported 4PB of online and object storage, and 2PB of nearline storage. HUS enables Intersect to cost-effectively manage large, file-based, unstructured data. This high-density storage comes with comprehensive and integrated management for block, file and object data as well as dynamic provisioning, dynamic load balancing and auto-tiering capabilities.

HNAS enhances the economics and functionality with an efficient, highly scalable, and high-performance NAS system that also automates system failover and failback with high-speed, object-based replication for disaster recovery. Using a policy-driven tiering system, the Hitachi infrastructure solution moves research data after it is examined and analysed into the SpectraLogic tape library. This tiering ensures that the organization has cost-effective, long-term storage for less frequently used data assets.

While storing and managing the research data was a key requirement, it was equally vital to properly catalogue and enable easy discovery of the data. Hitachi Content Platform allows Intersect to store, share, synchronize, protect, preserve, analyse and retrieve file data in a single system. With its unique metadata gathering and scalability from a few terabytes to tens of petabytes, HCP creates a secure multi-tenancy content cloud for file access, sharing and collaboration on the Intersect facility. Researchers access the content cloud via a centralized portal, which creates a virtual laboratory environment. "We need to provide a high-bandwidth environment and error-recovery with self-repairing software that ensures no loss of data and a very low file-corruption rate," Gibson said. "Hitachi provided us with those software features and we are now able to manage vast amounts of scientific information."

The Result

A consolidated research database to facilitate life-saving research

The Intersect research node now connects 12 leading universities in New South Wales, including the University of New South Wales (UNSW), and the University of Sydney, 2 of the world's foremost universities, with other research bodies in Australia, Europe and the United States.

The data is accessible via high-speed access to AARNet (Australia's Academic and Research Network), the NeCTAR (National eResearch Collaboration Tools and Resources) research cloud, and high performance computing facilities. Access is delivered through file sharing, databases and applications.

Dr. Gibson explained, "The reliability, robustness and scale-out capabilities of the Hitachi Data Systems infrastructure enable us to provide an ideal platform of high-value services to research groups. They enable our researchers to securely store and share their data with collaborating partners and to meet their various legislative and compliance requirements."

Hitachi Solution Boosts Research Collaboration

Among the projects already live on the facility are a research collaboration that aims to find a cure for cancer, an environmental research initiative that is improving climate models, and a project that aims to help bilingual children in the Australian outback.

The Australian Breast Cancer Tissue Bank (ABCTB) exemplifies the innovation that Intersect's use of Hitachi solutions can bring to the medical research community. The ABCTB is a breast cancer research resource that is supported by a collaborative network of cancer clinicians and researchers, with the aim to improve outcomes for breast cancer patients. It is Australia's only large-scale collection of specimens

and data dedicated to sporadic breast cancer. These data collections comprise scans of tissue samples, associated clinical information and high-resolution images of tumour sections. The associated data can total up to 50TB. As a result, the ABCTB improved the availability of quality research for sharing and re-use among authorized researchers and clinicians, improved research efficiency, and reduced institutional data storage costs.

> **❝ This was a vital component of the Hitachi technology as we have to ensure the researchers can quickly get hold of the data, and make that data available anywhere and anytime. ❞** Dr. Ian Gibson, CEO, Intersect

"The Intersect facility allows research institutions such as the Australian Breast Cancer Tissue Bank to solve big data problems that involve geographically dispersed clinicians and research teams working with large amounts of data, searching for patterns that lead to new insights and, eventually, the development of new treatments and cures," Gibson explained.

The Data Repository of the Ecosystem Modelling and Scaling Infrastructure Facility (DR e-MAST) demonstrates the benefits of data-driven research for environmental monitoring. The data collection develops and assembles data sets for the improvement of models used for such applications as future climate scenarios and assessment of primary production, at a wide range of temporal and spatial scales, to help agricultural producers cope with the impact of climate change.

With 1 in 4 Australians born overseas, a project focusing on bilingualism in the bush helps investigate the language of immigrant families. It examines how the families in regional Australian centers maintain their children's home languages in the absence of the critical mass of speakers, networks and

resources found in metropolitan areas. The data collection consists of a growing volume of video and audio files stored on the Intersect facility. The objective of the research is to establish how families from multicultural backgrounds can best be supported through community and educational services. It aims to ensure that children grow up bilingual, with the attendant benefits of improved cognitive, social and academic skills.

Other projects using the Intersect facility rely on the technology platform to assist them in solving questions at the frontier of science. For example, the Archive of the Sydney School of Physics involves experimental, observational and high-performance computing (HPC) simulation of physical phenomena, from the minute scale of quantum physics to representations of the entire universe. Collections include Applied and Plasma Physics, CAASTRO (ARC Centre of Excellence for All-sky Astrophysics), Complex Systems, CUDOS (Centre for Ultrahigh-bandwidth Devies for Optical Systems), High Energy Physics, Integrated Sustainability Analysis, Medical Physics and the Sydney Institute for Astronomy.

Researchers at the school actively collaborate with colleagues at numerous Australian and international institutes, and the data in the Archive of Sydney School of Physics is crucial to these collaborations.

That complexity of information means Intersect has to manage specific requirements as data sets can consist of very small and extremely large files. Gibson said Intersect needed to create an automatic version of every data file, tier and examine that data as it is ingested into its facility, and then provide that data back to its research customers. "This was a vital component of the Hitachi technology as we have to ensure the researchers can quickly get hold of the data, and make that data available anywhere and anytime," Gibson said.

Next Dream
Big data brings new solutions to complex problems

The Intersect facility is now growing in size rapidly, and it is expected to provide members with direct access to up to 20PB of research data storage capacity by 2015. That growth is driven by data-intensive projects such as the gene sequencing research, which will continue to collect more data in an exponential curve larger than the concepts behind Moore's Law, Gibson explained. As the sheer amount of data is generated and stored, Intersect needs to ensure it can continue to manage, tier and securely host that information.

"Our promise to the research community is that we will look after your data and relieve you of the responsibility and stress of this task," he said. "We could not have done this without the scale-out technology and smart content management solutions delivered by Hitachi Vantara." Gibson estimated that up to 20,000 researchers across the research disciplines will be accessing data on this facility.

"The facility supports NSW researchers in maintaining their global contributions and competitiveness. In Hitachi Data Systems, we have found the ideal partner to keep pace with the rapid pace of global research demand," he added. The Intersect facility is funded by the Research Data Storage Infrastructure (RDSI) project, an initiative of the Federal Government. It is supported through Intersect member university contributions and the NSW Government through AUS$1M via the Science Leveraging Fund.

About Hitachi Vantara

Hitachi Vantara provides information technologies, services and solutions that help companies improve IT costs and agility, and innovate with information to make a difference in the world. Our customers gain compelling return on investment (ROI), unmatched return on assets (ROA), and demonstrable business impact. With approximately 6,300 employees worldwide, Hitachi Data Systems does business in more than 100 countries and regions. Our products, services and solutions are trusted by the world's leading enterprises, including more than 70% of the Fortune 100 and more than 80% of the Fortune Global 100. Visit us at **http://www.hds.com/anz/**.

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