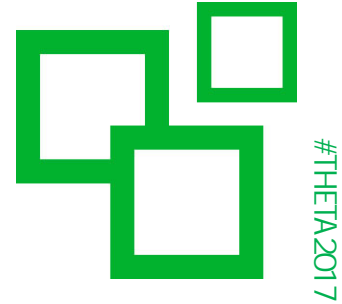


# Data Transfer Services University of Otago

Dave Maclaurin, Douglas Harre



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UNIVERSITY  
*of*  
**OTAGO**  
*Te Whare Wānanga o Otāgo*  
NEW ZEALAND

# Data Transfer Services University of Otago

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Manager / NeSI Site Manager (Otago)  
Douglas Harre (REANNZ)

# The University of Otago

- Approx. 18,000 Student & 3,800 Staff FTE.
- A research intensive organisation & the 10th largest IT site in NZ.
- A NeSI investor but not an HPC site. A REANNZ partner.
- Centralised research data storage clusters in place, 2.4 petabytes mirrored
- Transitioning to a fast new network University wide.

# Drivers for a High Speed Data Transfer Service

- NeSI ROI.
- Major 'big data' research projects underway
- Leverage our Isilon (HCS) central research storage clusters.
- Wanted to collaborate with NeSI on Data Services Strategy.
- Remove Research constraint; external hard drives; couriers.
- Network Edge was not designed for large research data flows - so we called REANNZ...

# Science DMZ Model

What is a Science DMZ?

→ A Science DMZ is a network enclave, at or near the site network perimeter, dedicated to supporting data-intensive science resources

- Dedicated systems for data transfer (DTNs)
- Integrated performance management and security
- Built with high performance components (high speed nic, storage)
- Addresses common network performance problems encountered at research institution
- Science applications will go through clean high bandwidth path
- Equipment, configuration and policies are optimized for high performance scientific applications

# REANNZ Identify and solve the problem

- Work with third party to identify the issue
- Engagement with REANNZ
- Collaboration on the design to meet campus/security policy
- Required changes to the topology to support the new model
- Identify/source required components

# REANNZ Plan and Implementation

- Planning and coordination
- Deployment of the solution
- Support and maintenance

# Network Challenges for a Data Transfer Service

- Think of a network 'pipe' – how to get the most data flowing through it per second, every second.
- Make sure your network 'pipes' are large – everywhere and at every junction.
- Make sure you have enough data ready to 'pour' into the network pipe – so you need fast multiplexed data storage at each end.
- How do you get data into the network pipe fast enough – use multiple high speed data 'pumps' - each uses many large 'data buckets'. They all pump at once.
- Keep the network data pipes below capacity and minimise the data flow controls.



# Organisational Challenges for a Data Transfer Service

- Important to provide an organisation wide data transfer service with publicity, clear use cases, an on-boarding process, FAQs, and support in place.
- Needs to be easy for researchers and must be part of their natural workflow – advantages must outweigh difficulty.
- Service needs to be tested & audited, and there must be ongoing monitoring including scripted measured transfers.
- Monthly Reporting must be in place.
- High service availability and performance levels must be maintained. This must hold across all campuses.

# Organisational Service Visibility

The screenshot shows the University of Otago Information Technology Services website. The page title is "HCS High Speed Data Transfer". The breadcrumb trail is "Home > ITS Services > Storage, Backup, and Hosting >". The page features a navigation menu on the left, a search bar at the top right, and a main content area with logos for NeSI and REANNZ. A "TOP ITS FAQs" section is visible on the right side.

UNIVERSITY OF OTAGO  
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OTAGO HOME

Information Technology Services  
Te Wāhaka Matua Hakarau Mōhiotio

About ITS  
Service Notices  
News & Events  
ITS Services  
Email, Messaging & Calendars  
Help  
Network  
Printing  
Security  
Software & Hardware  
File Storage & Servers  
Teaching & Research  
Telephones  
Training  
Usernames & Identity  
Web  
Forms  
Frequently Asked Questions  
Plans, Projects, and Policies


Home > ITS Services > Storage, Backup, and Hosting >


Search...

## Information Technology Services

Te Wāhaka Matua Hakarau Mōhiotio

## HCS High Speed Data Transfer

 **NeSI**  
New Zealand eScience Infrastructure



The HCS High Speed Data Transfer service is a joint research partnership between:

- Information Technology Services
- New Zealand eScience Infrastructure New Zealand ([NeSI](#)), and the
- Research and Education Advanced Network New Zealand ([REANNZ](#)).

### What the HCS High Speed Data Transfer service

**TOP ITS FAQs**

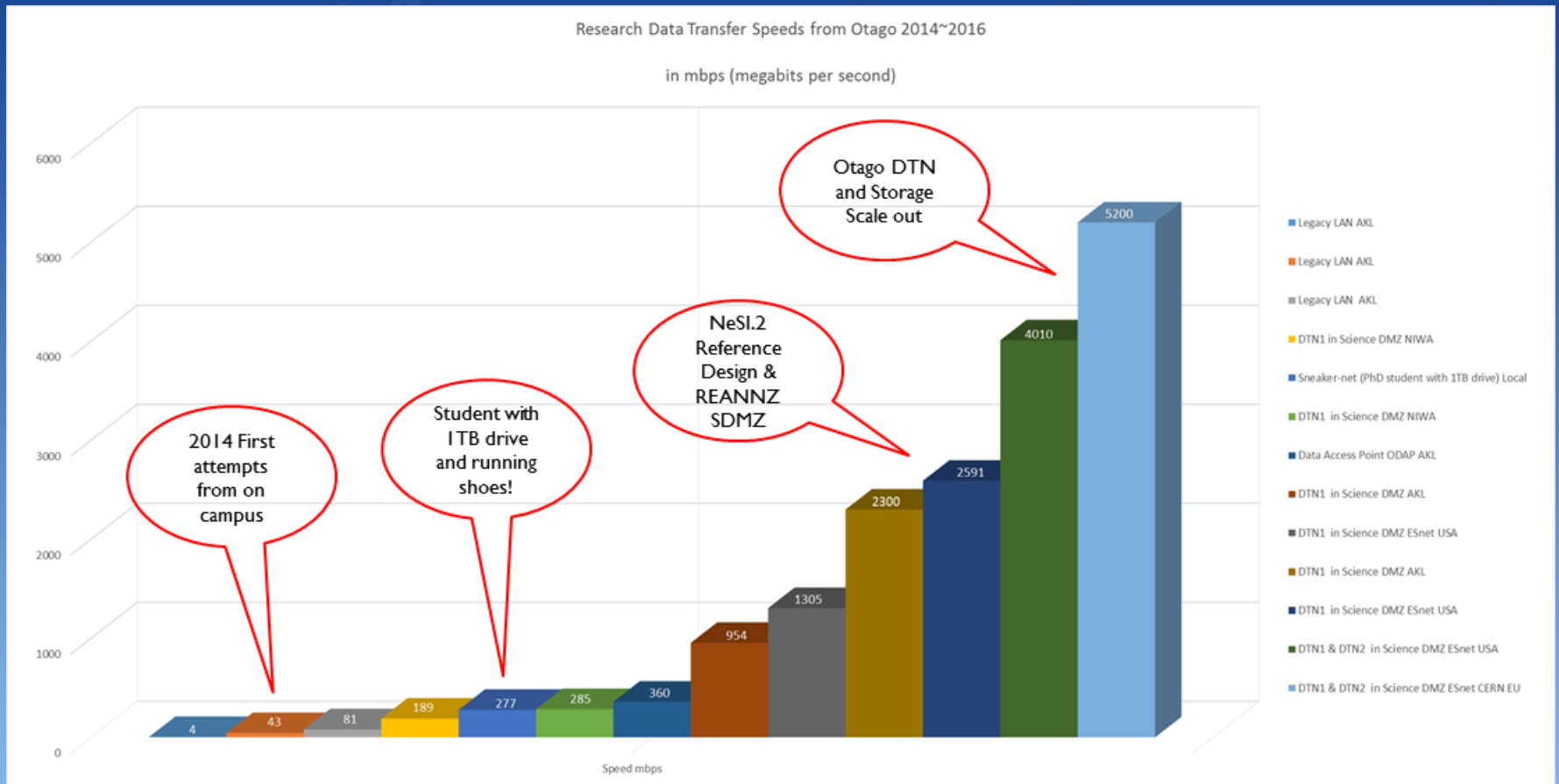
- Does the HCS High Speed Data Transfer service use the main University of Otago network?
- How fast is the HCS High Speed Data Transfer service?
- What is NeSI?
- I am a researcher at the University of Otago. Once my research group is set up to use the HCS High Speed Data Transfer service, do I need to contact ITS each time I want to transfer data?
- My University of Otago research team transfers data sets

# Data Transfer Service

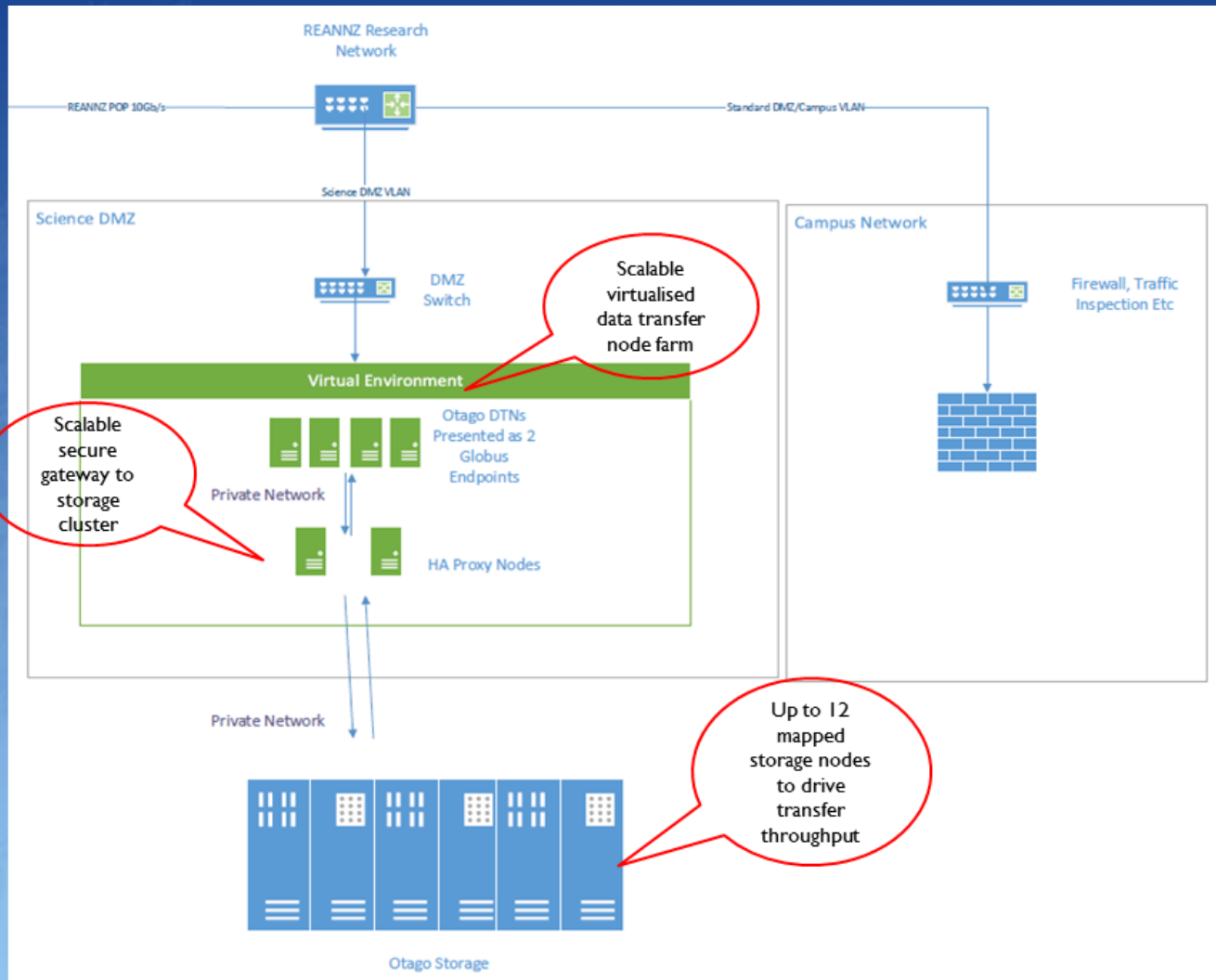
## Announcement - April 2016

- A collaboration : Information Technology Services (ITS), New Zealand eScience Infrastructure ([NeSI](#)), Research and Education Advanced Network New Zealand ([REANNZ](#)).
- Enables researchers who use HCS central storage, to securely transfer large research data sets, at the highest available network speeds, to NeSI high performance compute facilities around New Zealand, and to research facilities around the world.
- Available to all current research staff and post-graduate students, on all University of Otago main campuses (Wellington, Christchurch and Dunedin)

# Data Transfers - Throughput Achieved

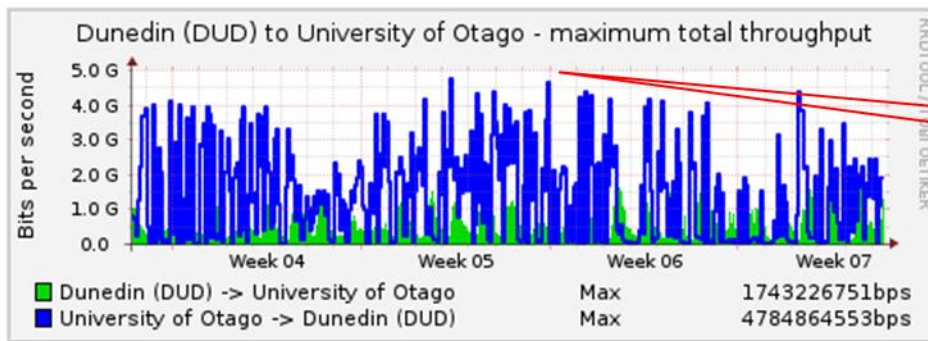


# Institution Data Transfer Solution Architecture

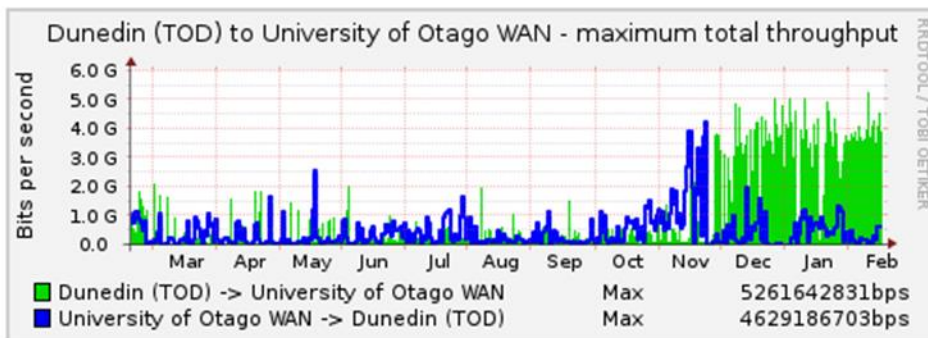


# REANNZ Weather Map view of Data Transfers

Dunedin (DUD) to University of Otago: Last Month



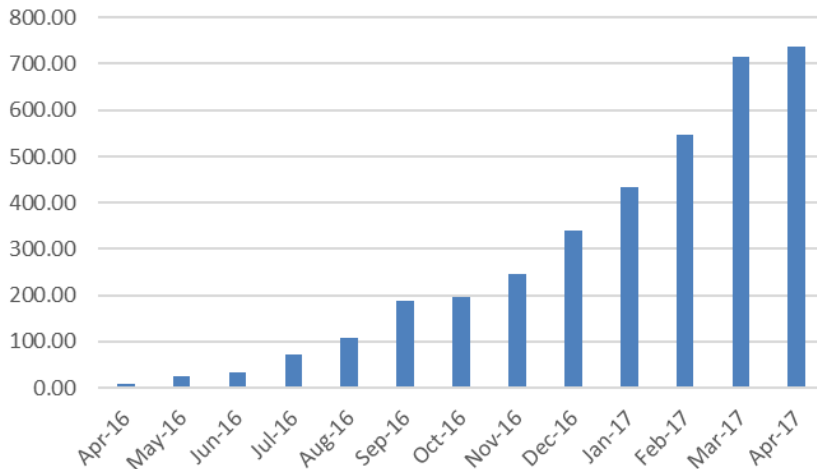
Dunedin (TOD) to University of Otago WAN: Last Year



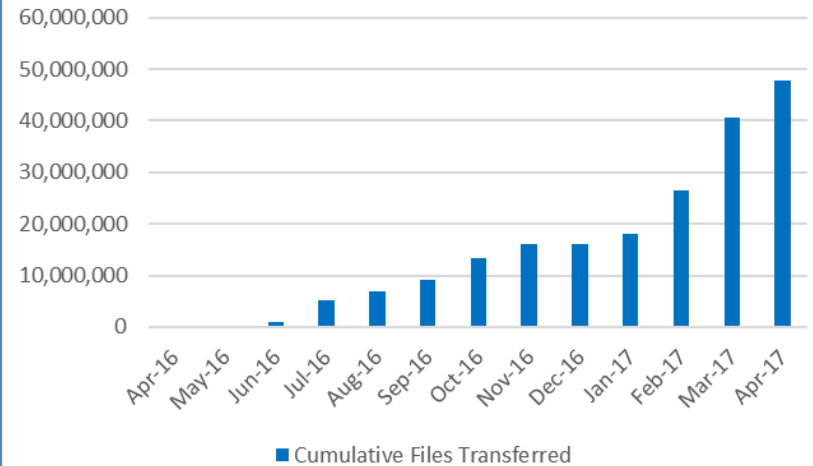
# Otago Data Transfer Metrics

## 2016~7

### Cumulative TB Transferred

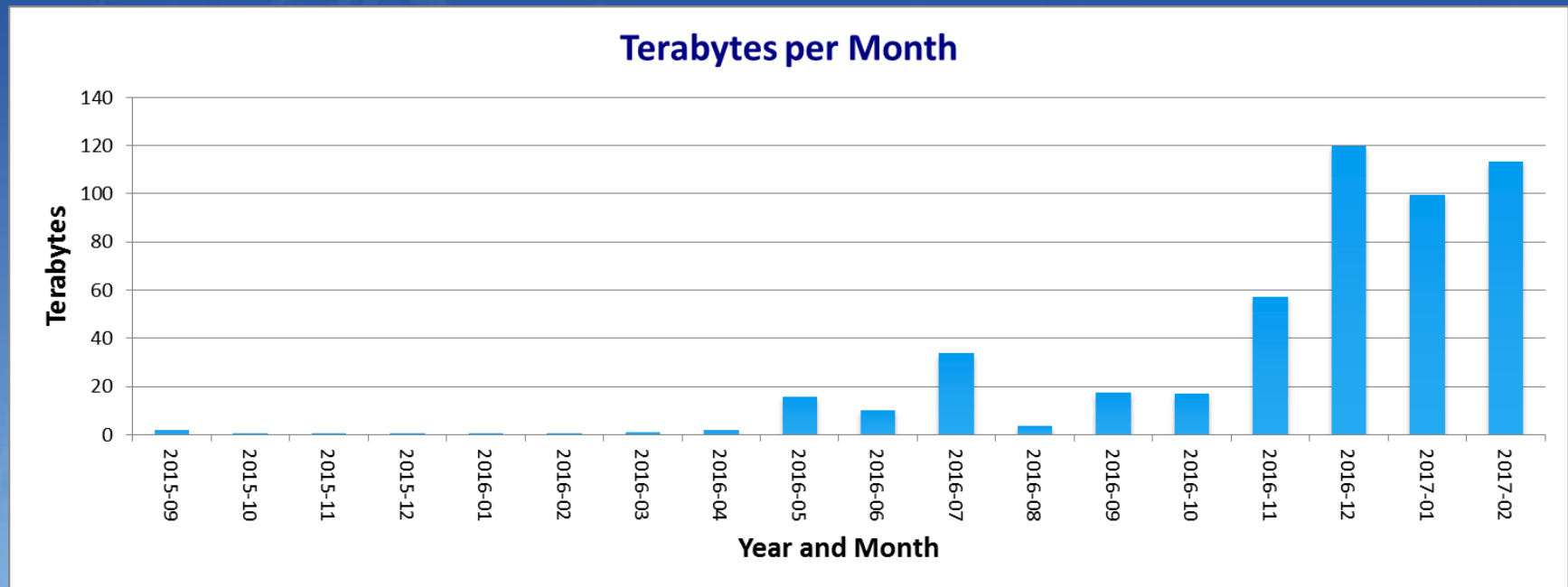


### Cumulative Files Transferred





# NeSI National Data Transfer TB/Month 2016~7





# Demonstration

- Case Studies
  - **REANNZ** – <https://reannz.co.nz/case-studies/getting-up-to-speed>
  - **NeSI** – <https://www.nesi.org.nz/case-studies/university-otago-technological-frontier>
  - **NeSI** – <https://www.nesi.org.nz/case-studies/university-otago-researchers-join-international-high-speed-data-superhighway>

# Acknowledgements

- Progress made possible through a close ongoing collaboration with NeSI @ NIWA people.
- Otago solution implements the NeSI.2 data transfer node reference design, and the REANNZ managed network edge and Science DMZ.
- Otago solution draws heavily on research work done by the US Energy Sciences Network (ESnet), and use of their public data transfer testing facilities.
- Special thanks to Peter Higbee, Jose Higinio, Gareth Wood and Richard Tumaliuan.