NeSI: behind the scenes

Gene Soudlenkov
(gene.soudlenkov@nesi.org.nz)

What is New Zealand eScience Infrastructure

NeSI's Collaborators — the University of Auckland, NIWA, University of Otago, and Manaaki Whenua - Landcare Research — are asset holders of the national HPC platform. This comprises the Māui and Mahuika platforms and a shared data storage system, hosted at the NIWA High Performance Computing Facility in Wellington and serving researchers across the country.

Core services

Core Services

High Performance Computing & Data Analytics

Consultancy

Training

Data Services

Shared infrastructure

Māui

Mahuika

>136 million	>1.7 petaflops	>130 GB/s
CPU core hours available per year	peak performance	IO bandwidth

Data replicated in Auckland. National research network provided by REANNZ.

15 PB
in tiered data storage

7
managed endpoints (four currently live, three additional coming online in 2021) linking New Zealand institutions to the National Data Transfer Platform and other endpoints around the world.

What is support

- Activities and processes required for successful execution and completion of a revenue generating core program or process
- IT support service is a process of providing support to all kinds of IT-related issues such as network setup, database management, cloud computing and so on.
- Depends on when and who you ask

What is technical support, really?

- A technician
calling for qualified engineering help

- In the 1960s, computers
were room-sized, highly specialized,
prone to err and costing a fortune

What is technical support, really?

- Rise of mass technology

- Tech
support finally included real users

- Complex network
connections became widespread

What is technical support, really?

- Explosive
enlargement of IT landscape

- Correspondingly rapid increase
of demand for technical support

- Birth of DevOps concept

What is technical support, really?

- Demand
for tech support increased further

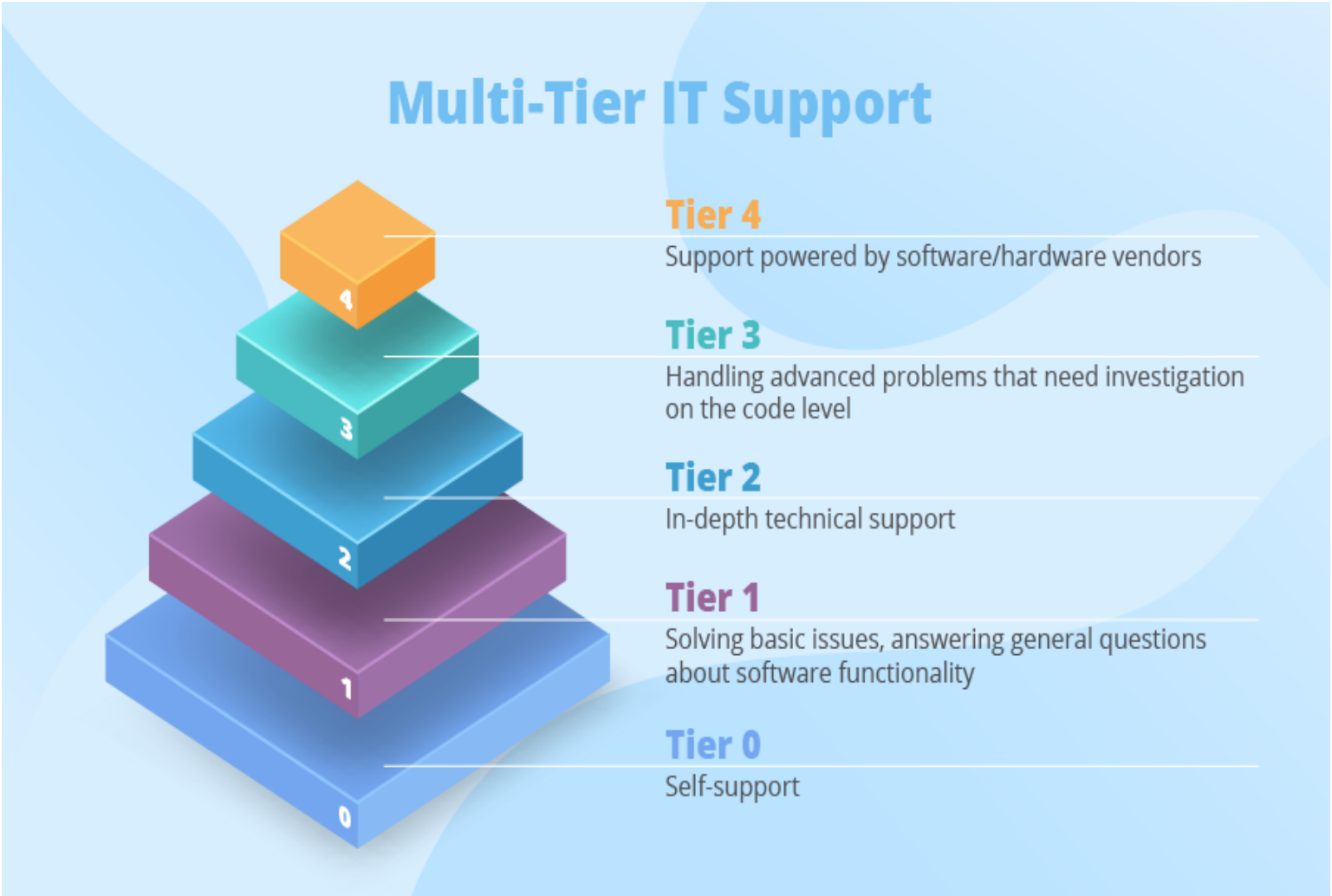
- NeSI absorbed best
IT support practices of the past and actively evolves to accommodate the complexities of modern HPC services

- Support team members are
highly qualified individuals, capable of working independently or in a team

Tiered support model

- **Low-Level** - Fundamental business IT tasks help
- **Mid-Level** – Basic IT support in addition to more complex technical services
- **High-Level** - All of the above with the inclusion of support for your network, data analytics, and more

Tiered support model

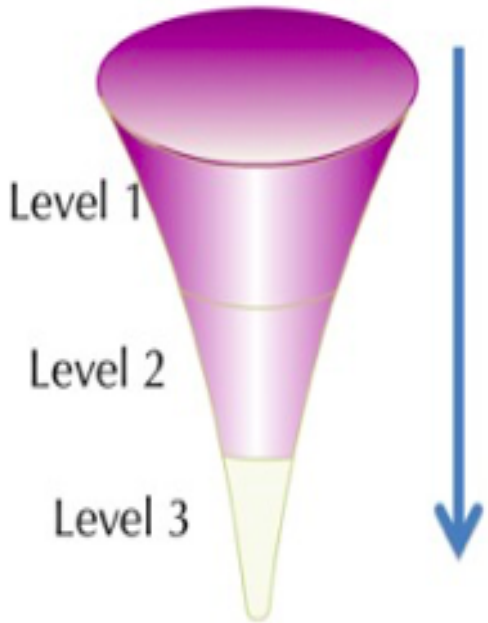


Considerations

- Distributed nature of the team
- Heavy involvement in other NeSI groups and projects
- Varied nature of support requests and workflow development support
- Complexity of the supported systems (1960 with the vengeance?).

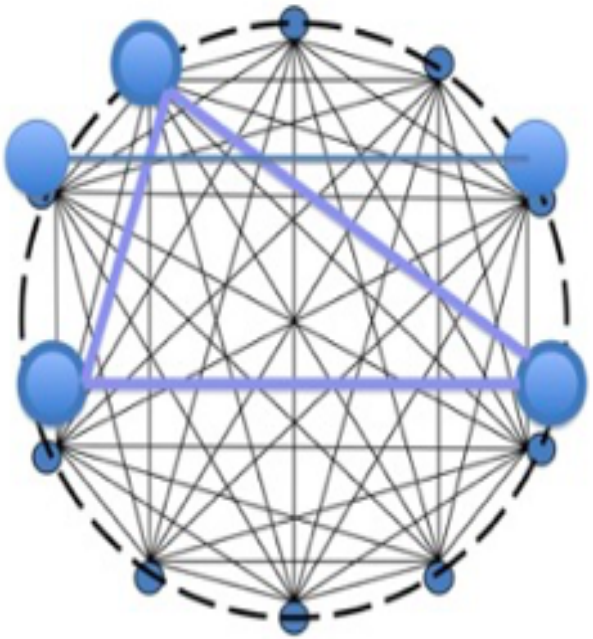
Swarm support model

Old Model: Streaming



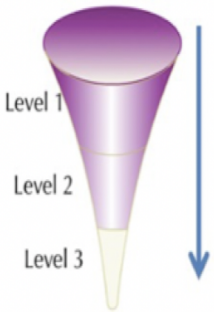
Escalation based process

New Model: Swarming

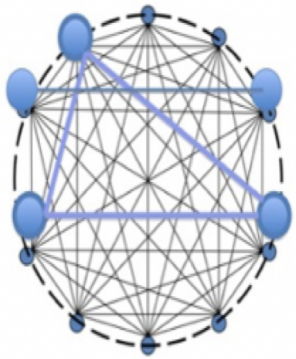


Collaboration based process

Swarm support model



Tiered support	*Swarming*
Siloes and hierarchies	Network
Directed	Collaborative
Linear, rigid	Dynamic, loopy
Measured on activity	Measured by value creation



Team responsibilities

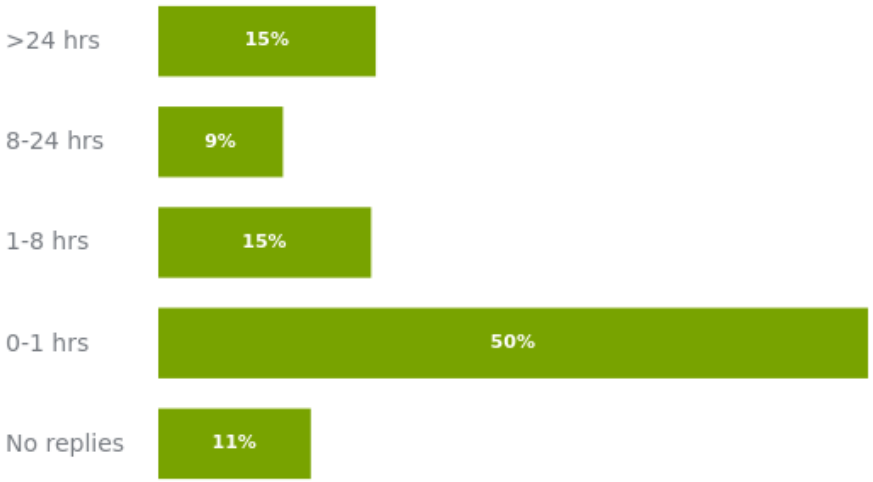
- Slurm administration and configuration
- Fairshare configuration
- Support requests handling
- Software installation and upgrade
- Documentation (internal and external)
- Nearline service support and continued development
- Eligibility service
- Training and education
- Genomics Aotearoa support
- Data transfer support and storage management

Instruments of trade

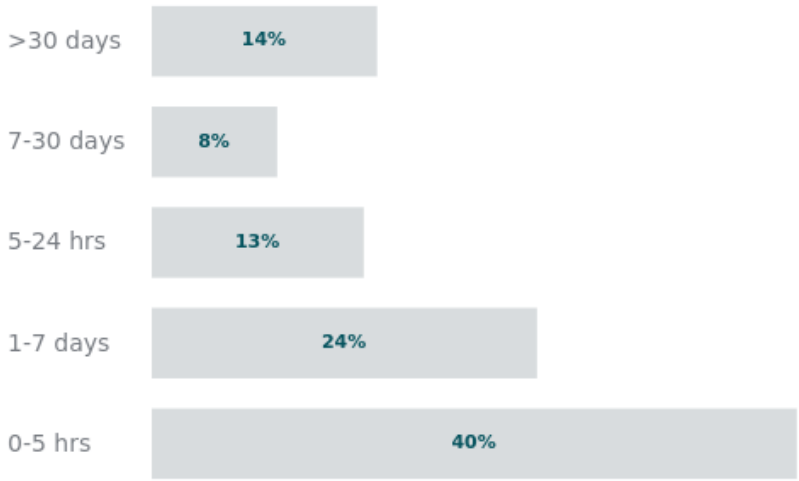
- Communications: email, Slack, Zoom, Teams
- Tickets support: Zendesk, Jira
- Documentation: Zendesk, Wiki
- Reporting: Grafana, Prometheus
- Databases: MariaDB, Postgresql

Support statistics

- In 2021 over 5000 tickets were received and solved
- Team members participated in over 130 training events with almost 1000 attendees



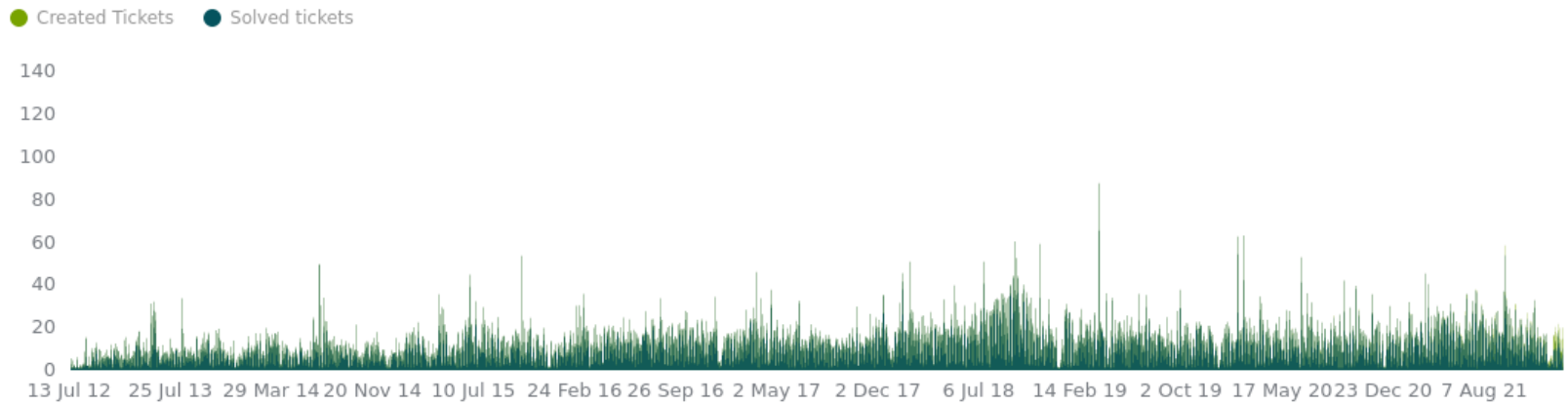
(a) First reply time

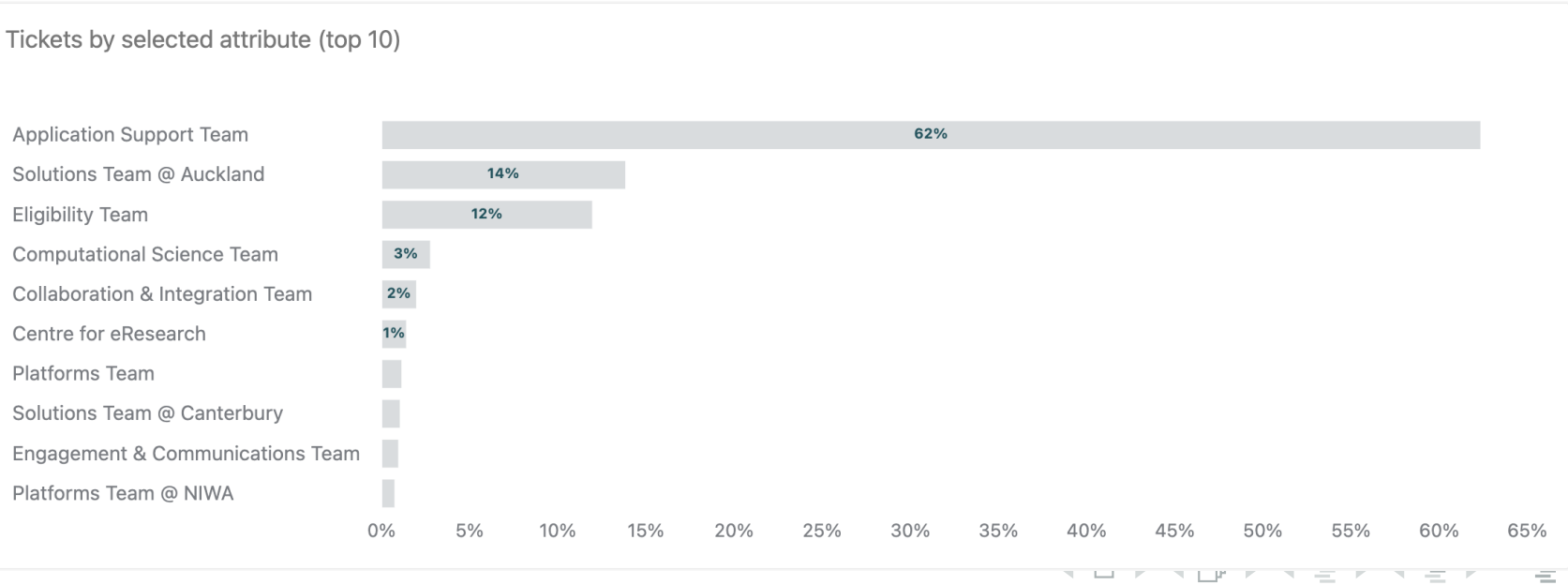


(b) Full resolution time

Support statistics

For the period of 2012-2022 over 36,000 tickets were solved





Software packages and libraries

- Install and maintain a variety of scientific applications and packages
- Over 1000 packages and libraries are currently available (including multiple versions of some packages)
- Maintain license servers and license configurations
- Maintain GPU-related software
- Maintain complex workflows, which enable large variety of scientific disciplines

Training and education

- Regular introductory workshops (introduction to NeSI)
- Specialised HPC workshops, including parallelisation optimisation of software
- Software carpentry, including HPC carpentry
- Specialised bioinformatics capability development workshops

Questions & Answers

NeSI
New Zealand eScience Infrastructure