



Staying connected with the future of New Zealand's digital research

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February 2019

What are the opportunities and challenges around advanced computing for NZ's research communities 5 to 7 years in the future?

The national situation is intensifying!



Growth Hacking

- I worked for a small start-up before joining NeSI
- Worked with a *growth hacker*
- Social media marketing, user behaviour analysis
- Fail fast, trial and error

Growth Hacking

Building genuine connections, finding the truth, finding what resonates with the users - keys to sustainable business.





What we did

What are the opportunities and challenges around advanced computing for NZ's research communities 5 to 7 years in the future?

Reaching out

- Structured interviews with 26 leading researchers from NZ representing various fields of research, NSCs, and CoREs.



- 6 questions with focus on 5-7 years out in the future
 - Drivers of research
 - Research methods
 - Collaboration
 - Skills and capabilities
 - Advanced research computing
 - What can NeSI do?

Bringing clarity to the complex landscape

- NeSI.3 business case
- Building genuine connections and finding the truth
- Building an ongoing relationship
- Understanding of the future that is complex and always evolving







What we learned

Four main topics

The following common topics were mentioned through the interviews, and the following slides will explore some examples:

- **Collaboration and interdisciplinarity:** Collaboration and interdisciplinarity are becoming more common, enabled by shared computational and analytical skills and language. As interdependencies develop across research investments and activities, the sector needs to enhance coordination and networks.
- **Programming and analytical skills:** Programming and analytical skills are becoming core to many research disciplines, with needs for support, training, and advice becoming critical as software becomes a common form of scientific models and methods.
- **Increasing needs for advanced research computing:** Growth in data, increasing complexity of models, increasing diversity of research drivers, and a spread of maturity suggest increasing needs for advanced research computing and for broadening support. Service experiences need to meet a range of researcher profiles, from those needing support through to those most self-sufficient.
- **Māori data and sensitive data:** Emergence of research teams working with Māori data, needing to support sovereignty and Vision Mātauranga, as with other forms of sensitive data such as in biomedical research and in working with population and administrative data.

Collaboration and interdisciplinarity

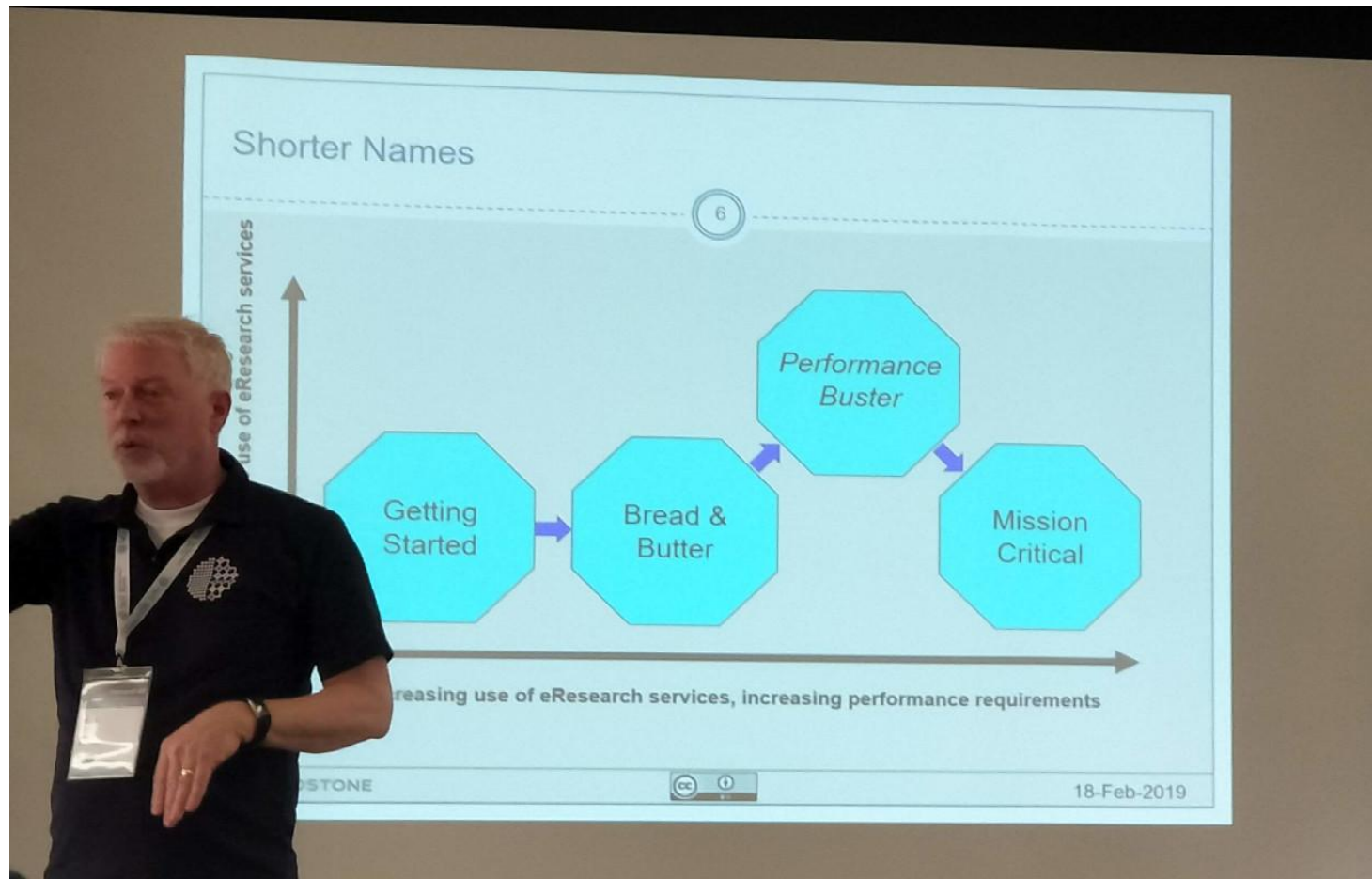
- Importance of international collaboration
 - e.g. Prof. Richard Easter - World's largest telescope being built in Chile - NZ plays an important role due to geography

“It is very important to stay engaged in what's going on internationally. International collaboration provides a good opportunity for student experiences, going to work for other research groups. There is a small barrier because computational work provides the common language.”

- Multidisciplinary by nature
 - Working with psychologist, social scientist, and data analyst
 - Upskilling to build the common language

Programming and analytical skills

- Broad needs
- Thinking with codes
 - Researchers need to understand what models are being used and understand what's going on under the box.
- More support to turn researcher's ideas into reality



STONE



18-Feb-2019

Analytical skills continued...

- The gap between professional and amateur scientists is closing
- Working with non-traditional data, citizen data
- FAIR (Findability, Accessibility, Interoperability, and Reusability) principles for data - and software sustainability

Increasing needs for advanced research computing

- Genome sequencing techniques
 - magnitudes of growth in data generated
- Cheaper sensors
- More data driven approach to other fields of science
- Machine learning - ABI hiring experts

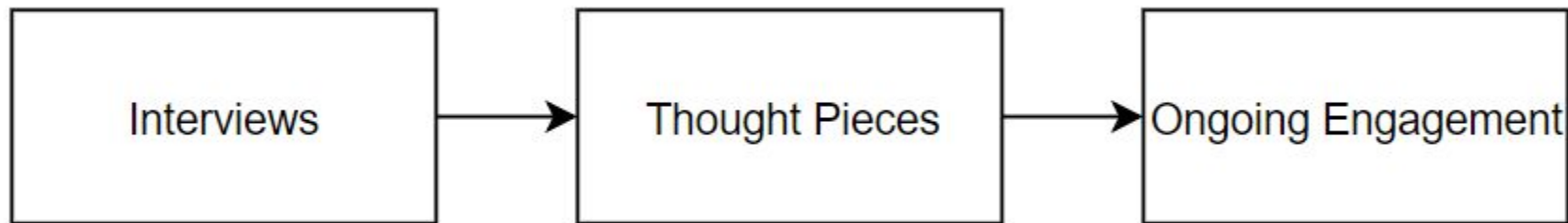
Māori data and sensitive data

- Infrastructure to handle sensitive data
 - Prof. Shaun Hendy mentioned an example of working with the government in the past where sensitive social data from a particular department had to be transferred physically by memory stick. In the future, he sees having a shared data environment with the government departments.
- e.g. Prof. Tony Blakely - Concerns around social licenses to use data - what consent means
- Challenges in data sovereignty and working with Māori data



What's Next?


Pipeline



Sharing back to the community

We have our first thought piece up on the website


- <https://www.nesi.org.nz/staying-connected>
- Dr Thomas Etherington, a geoinformatician and ecologist at Manaaki Whenua - Landcare Research

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New Zealand eScience
Infrastructure

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For our first thought piece, we have **Dr Thomas Etherington**, who has commented on the research being undertaken by his colleagues at **Manaaki Whenua – Landcare Research**. [Dr Thomas Etherington PDF \(3 pages\)](#)



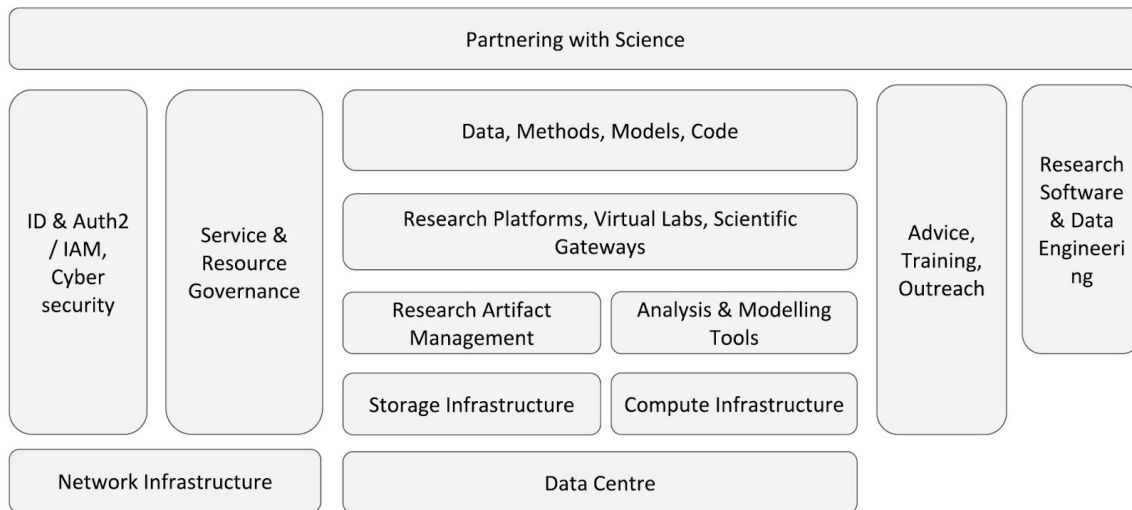
Dr Thomas Etherington - a geoinformatician and ecologist at Manaaki Whenua - Landcare Research, a member of New Zealand Ecological Society, and a fellow of Software Sustainability Institute.

His research is interdisciplinary, using computational methods to examine environmental questions and problems through the combination of theories and methods from geography and ecology. He has deep interest in sustainable software – reproducible and open science, and how researchers interact with data. He says that although recent colleagues probably wouldn't believe it, in the distant past he even spent time in the field tracking badgers and bears.

Strategy
Staying Connected

Strategic building blocks

- eScience Futures Workshop
- International benchmark studies
- Research community consultation



We want to hear from you

- Please reach out to our communities manager Nooriyah at nooriyah.lohani@nesi.org.nz

We would like to thank the NeSI Research Reference Group for piloting our interviews, and all 26 researchers for sharing their insights.



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NeSI @ eResearch NZ - Talks & Workshops:



Monday 18 Feb

2:10 - 2:30 pm - Understanding research drivers for NZ's advanced research computing

2:30 - 2:50 pm - How NeSI helps Manaaki Whenua - Landcare Research monitor land cover changes

3:30 - 3:50 pm - NeSI Futures

4:30 - 4:50 pm - Research sector investments – What we've learnt and where we might go

4:30 - 5:30 pm - Training Community BoF

4:50 - 5:10 pm - Catering to domain (Genomics) specific eResearch needs

Tuesday 19 Feb

11:00 - 11:20 am - The NeSI HPC Compute and Data Analytics Service

11:00 am - 12:30 pm - Open Space Session - BYO topics!

11:20 am - 11:40 am - Deploying a Globus endpoint in an NZ institution

1:30 - 1:50 pm - Visualization capabilities of NeSI's new high performance computers

1:30 - 1:50 pm - A day in the life of NeSI's Apps Support

1:50 - 2:10 pm - NeSI and your data: Scalable storage

1:50 - 2:10 pm - Research Software Engineering (RSE): What's in a name?

Tuesday 19 Feb (cont.)

2:10 - 2:30 pm - Kicking On: Scaling new data services at NeSI

2:30 - 2:50 pm - Insight into the new NeSI platforms

3:30 - 4:30 pm - (Inter)national collaborative research infrastructure strategies BoF

3:30 - 4:30 pm - Research Software Engineering BoF

4:30 - 5:30 pm - Research Cloud NZ BoF

Wednesday 20 Feb

11:10 am - 4:00 pm - Hacky Hour / Bring Your Own Code Workshop