



REANNZ

REANNZ – THE NREN FOR NEW ZEALAND

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TEIN4 NOC ANNUAL
CONFERENCE 2015

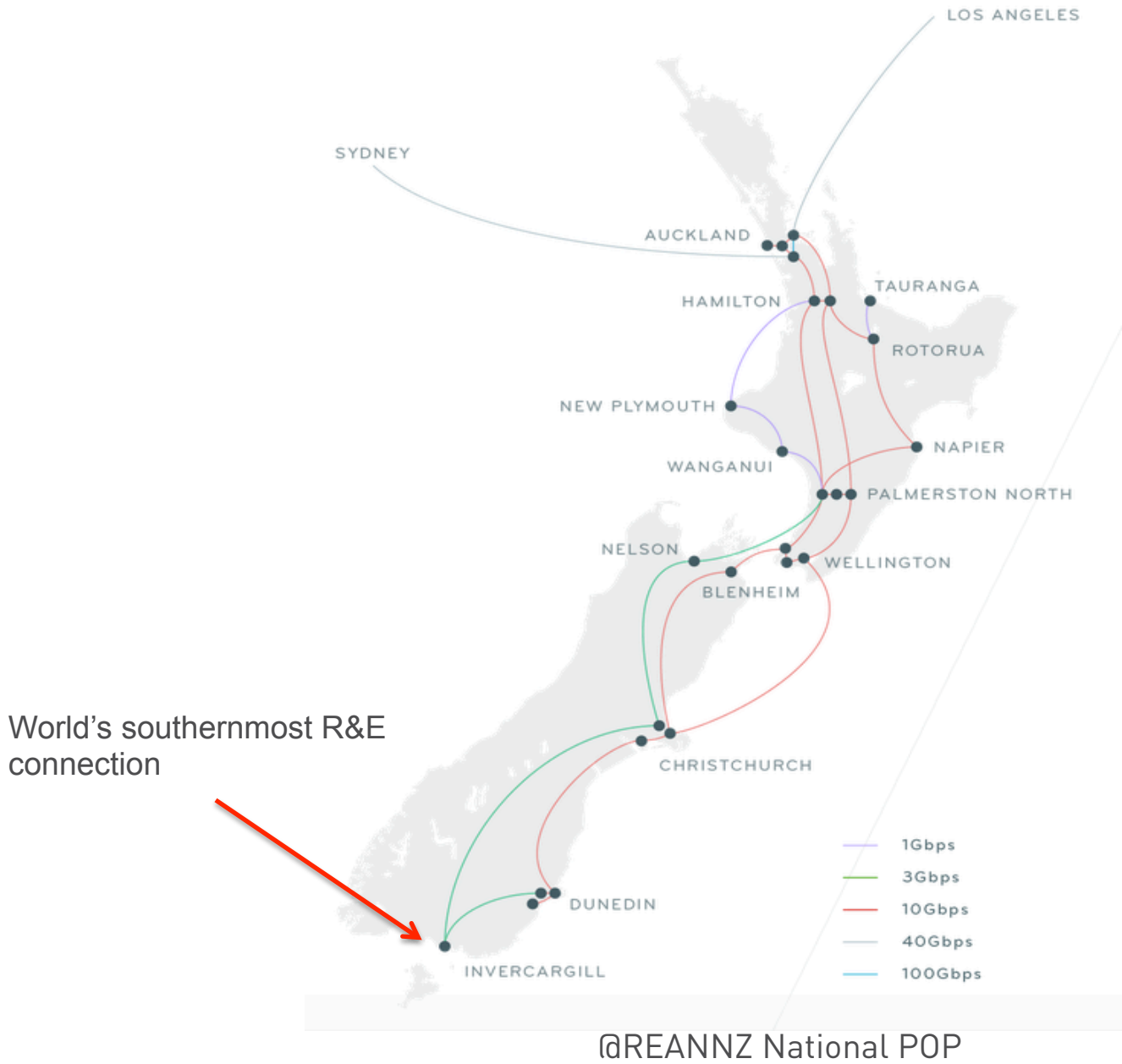
REANNZ

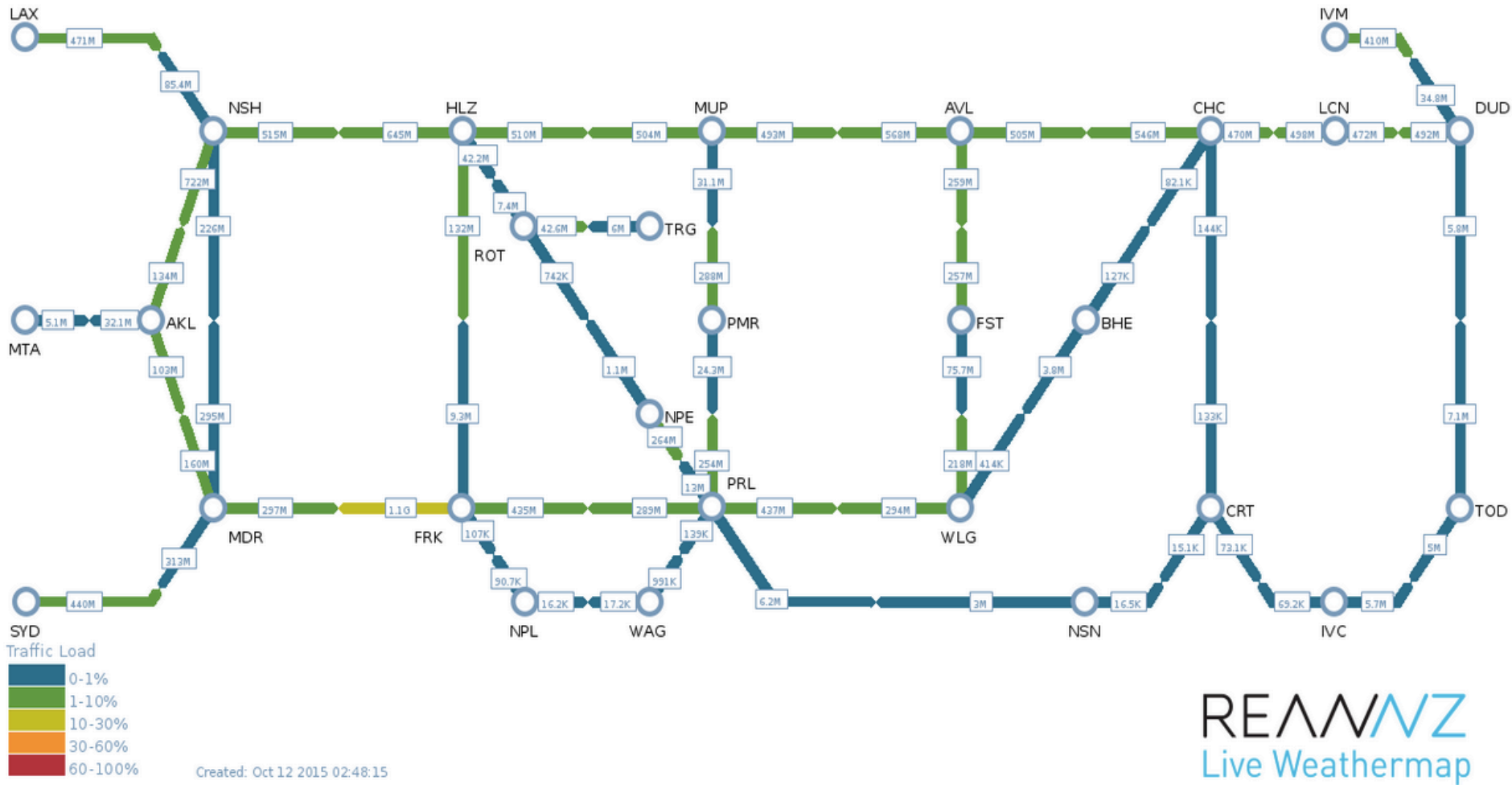
REANNZ (Research, Education Advanced Network New Zealand)

“builds and operates the nationwide high-capacity, high-speed network service, that connects New Zealand’s research, education and innovation organisations to one another and to the rest of the world”.

Introduction

- REANNZ is previously known as KAREN (Kiwi Advanced Research Education Network)
- Our Purpose: To establish and operate the Advanced Network in order to promote education, research and innovation for the benefit of New Zealand
- A crown-owned not-for-profit company
- The network were commissioned in late 2006
- Backbone consists of high-speed optical network connecting points of presence (PoPs) throughout New Zealand.
- Staff are mostly based in Wellington (capital of New Zealand)
- Governed by 5 person Board of Directors responsible for establishing strategic policy, guiding and monitoring the business.







REANNZ & other R&E POP (International)

IP Allocations and ASN

ASN: 38022

IPV4: 140.200.0.0/16

163.7.128.0/17

210.7.32.0/20

IPV6: 2404:138::/32

2404:139::/32

Peering with:

Vocus (9503), APE (9560), WIX (9439), CHIX (24388) – Domestic & Internet Exchanges

AARNet – 7575 (International Commodity)

AARNet – 7575 (40Gb/s R&E)

TEIN via AARNET - 24490 (100Mb/s R&E)

Infrastructure information

Hardware's:

- Juniper MX 480, 104, 80
- Juniper EX 4000, 3000, 2000 series
- Juniper SRX 3000, 600, 200 series
- Brocade MLX NetIron series

Optical Transmissions:

- Infinera DTN-X series
- Cisco ONS
- DWDM
- Dark Fibre

Applications:

- Open Source, In-house (proprietary)

Capabilities and Features

- > Full ISP (but caters only to R&E and Innovation community)
- > 40Gb/s international R&E network, Auckland to Sydney and Auckland to Los Angeles
- > Two international landing points in Auckland connected by 100Gb/s ring
- > Mostly 10Gb/s diverse POP connectivity and some 3 and 1 Gb/s nationwide with plans to upgrade in the pipeline.
- > Average of 120 milliseconds between Auckland and Los Angeles.
- > Less than 30 milliseconds nationwide (from the northernmost POP to the southernmost POP).
- > Network is designed to be physically resilient to major disruption (NZ has many earthquakes and active volcanoes).

Performance

Uptime → National: 99.99% International: 100%

Capabilities and Features

- > Members consists of universities, government agencies, research institutes, polytechnics, libraries,
- > REANNZ has a shared network with Vocus (3rd largest nationwide telecoms provider) where we've invested in their network and own 25% of the optical transport platform.
- > 26 PoPs located nationwide
- > Built using mostly Infinera optical hardware and Juniper hardware in all PoPs.
- > Offers 9K MTU to member connections and/or 1.5K MTU depending on the network capability of a certain member network.
- > Point-to-point, point-to-multipoint services.
- > 24/7 engineering support with a one hour response time for urgent change requests.
- > On-network caches from a number of major content providers (including Netflix, Akamai and other video service providers)

How our members use our network

- > Participating in international, data-intensive research (e.g. SKA, etc.)
- > Gathering data from remote scientific instruments without leaving their campus
- > Sharing large scientific data sets
- > Running high-speed remote backups
- > Processing data using remote supercomputers
- > Communicating with colleagues over fast, clear and reliable video conferencing
- > Enjoying fast, reliable everyday network and internet access
- > And more...

Other things that REANNZ does:

- > Represents New Zealand in international forums (GLIF, APRICOT, APAN)
 - Hosted GLIF 2014 @ Queenstown (where REANNZ deployed first 100G research network across the Pacific into a hotel (<http://tinyurl.com/pruqmdq>))
 - Hosting APRICOT 2016, possibly APAN in 2017
- > Regularly contributes to local/international research and education conferences, network and security forums (e-Research, NZNOG, AusCERT)
 - Hosted e-research NZ @ Queenstown last March 2015
- > Supports the community by providing scholarship and experience opportunities by taking on projects that help improve our products and services
 - three students annually partake in summer paid internship future funds programme
- > Participates in Enlighten Your Research Global scholarship programme.
 - Recently join eleven leading NRENs to collaborate and accelerate international research
- > Active development of SDN in collaboration with the community and industry.
- > Helping to build one of the largest supercomputer SCInet infrastructures at SC16 in Texas.

Other REANNZ services:

- > Eduroam – allows students, researchers and staff from participating institutions internet connectivity across campus and when visiting participating institutions.
- > Tuakiri – New Zealand’s national identity federation for the research and education community that enables students, academics, alumni and researchers get secure and seamless access to their computing resources.
- > Security Solutions – Engage and work with the members to understand their security requirements, technology choices and the manner in which the solution is deployed and managed.
- > Professional Services – Some of the services we offer includes but not limited to (Network Architecture design, performance management, software define networking, proposal design and review, community procurement management, project management, last mile connectivity).
- > Managed Services and PerfSONAR deployment

Some of the tools we use @ REANNZ

- > Weathermap – provides traffic information between POPs
- > Icinga – visual dashboard that provides instant visual network alert
- > Scruffy – port information (optical light levels, traffic utilization, etc.)
- > Firewall counters – provides information on bandwidth utilization on individual prefix
- > Port Register – optical transceiver info, serial numbers, VLAN's/VPLS ID's, etc.
- > Smokeping – latency measurement tool
- > IPAM – ip address management tool (strictly being adhered by everyone who uses it)
- > RIPE BGP Play – use to visualize changes in BGP routes (proven to be very useful)
- > RIPE BGP stat – provides a consolidated information based on IP, ASN, hostname and a bunch of Perl or Python (depends on who created it) scripts that helps in automating tasks.

Thank you.

www.reannz.co.nz

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