REAWNZ

WHAT REANNZ HAS LEARNED ABOUT ASSESSING RISK IN THE PHYSICAL NETWORK BUILD

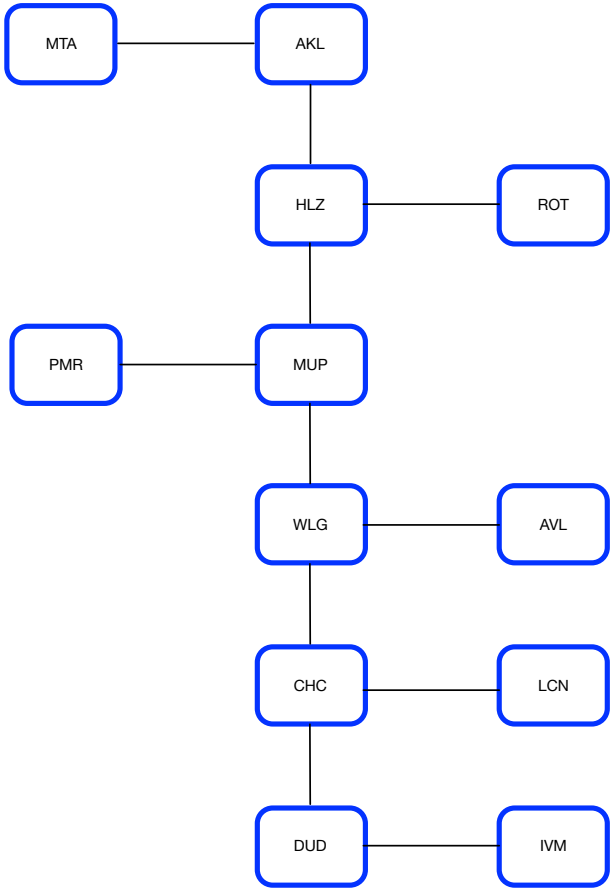
DESIGNING FOR HIGH AVAILABILITY

- Consider requirements
- Consider budget
- Avoid complexity
- Understand single points of failure
    - Connectivity
    - Power
    - Hardware

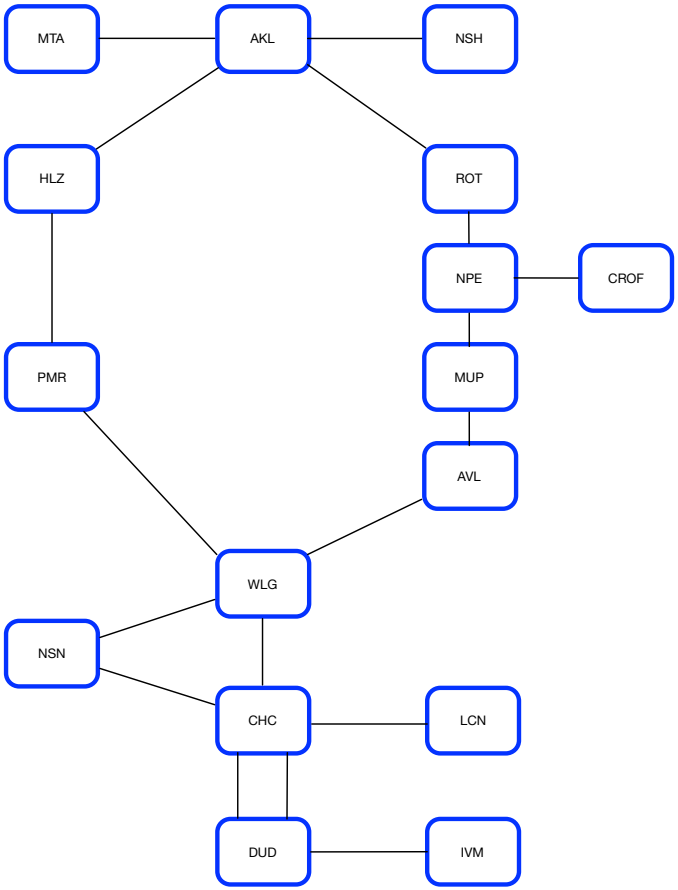
CONSIDER REQUIREMENTS

- What does high availability mean to your business?
  - 99.99% is 52 minutes 36 seconds per year
  - 99.999% is 5 minutes 15 seconds per year
  - 24x7 or 8x5?
  - Scheduled maintenance time?
- Network availability and service availability can be different

AN EXAMPLE OF REQUIREMENTS VS BUDGET



MORST RFP Design for NREN

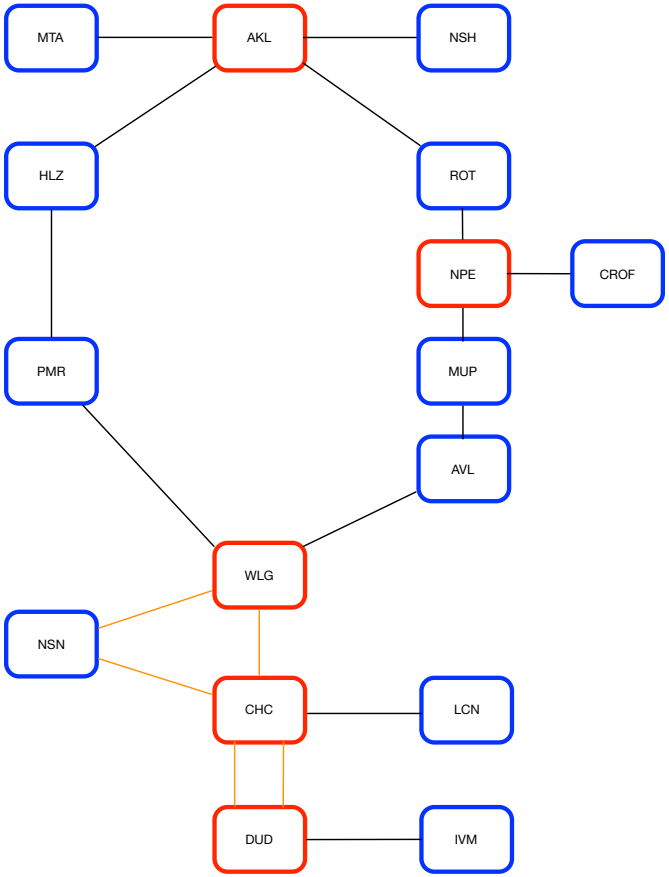


KAREN 2006

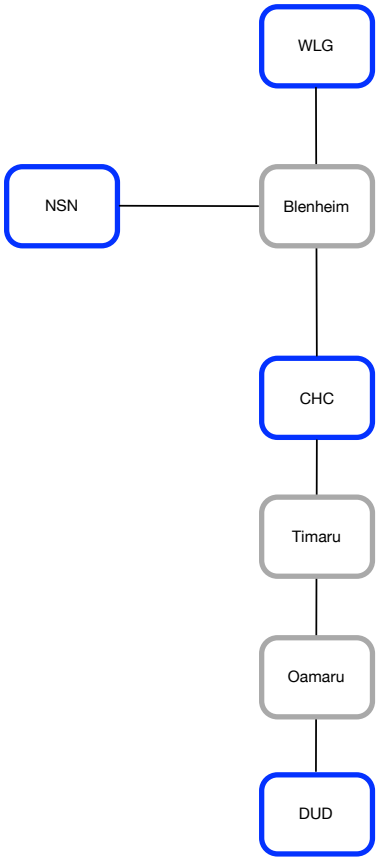
AVOID COMPLEXITY

- Chose which layer your network will be protected at
- Consider soft failures as well as hard failures
- How trusted is the technology?
- While automated failover is usually the right answer there are times where it’s not achievable
- Where are spares located?

REANNZ 2006 - SOME OBVIOUS POINTS OF FAILURE & SOME NOT SO OBVIOUS



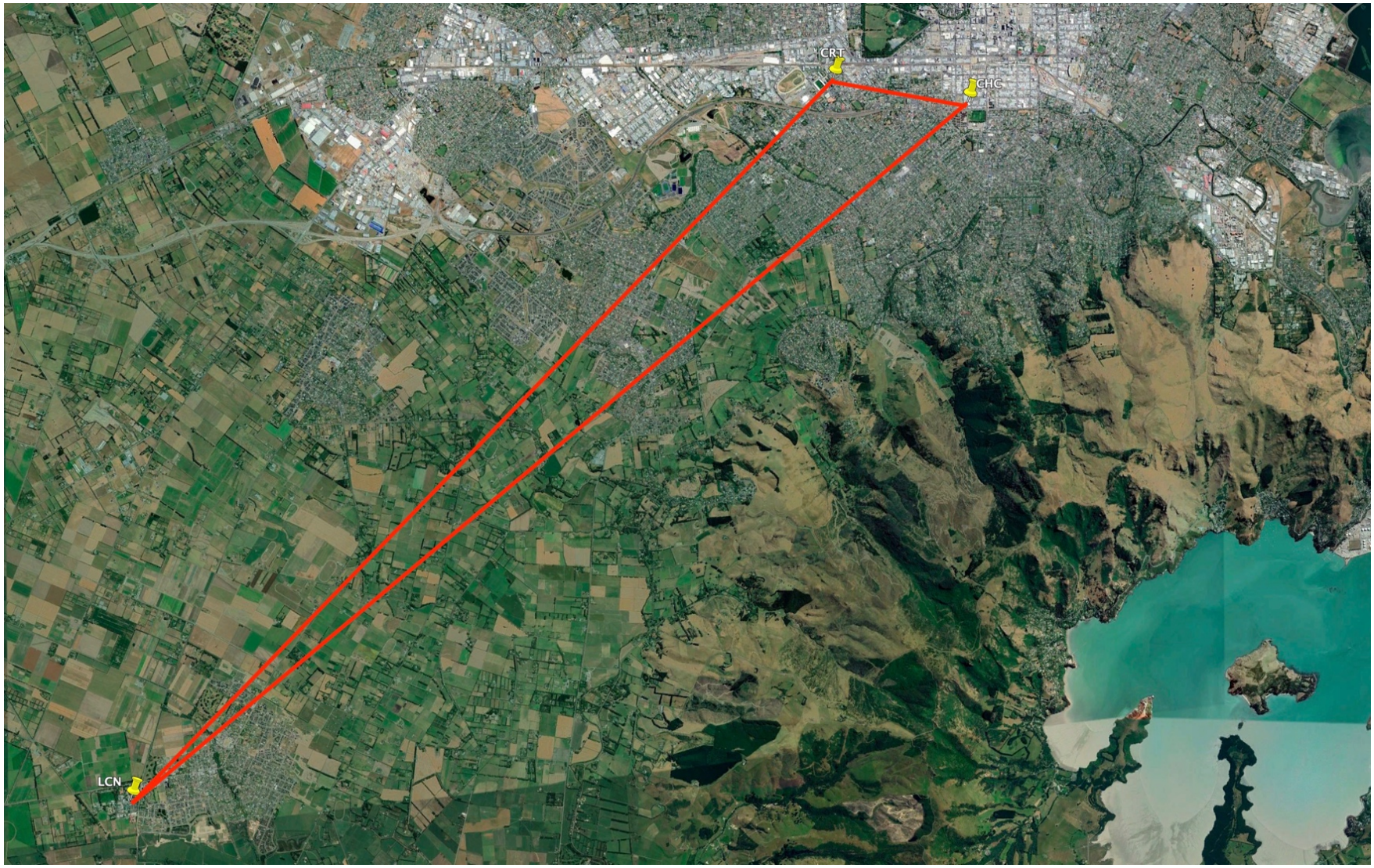
PHYSICAL INFRASTRUCTURE MATTERS WHEN ASSESSING RISK



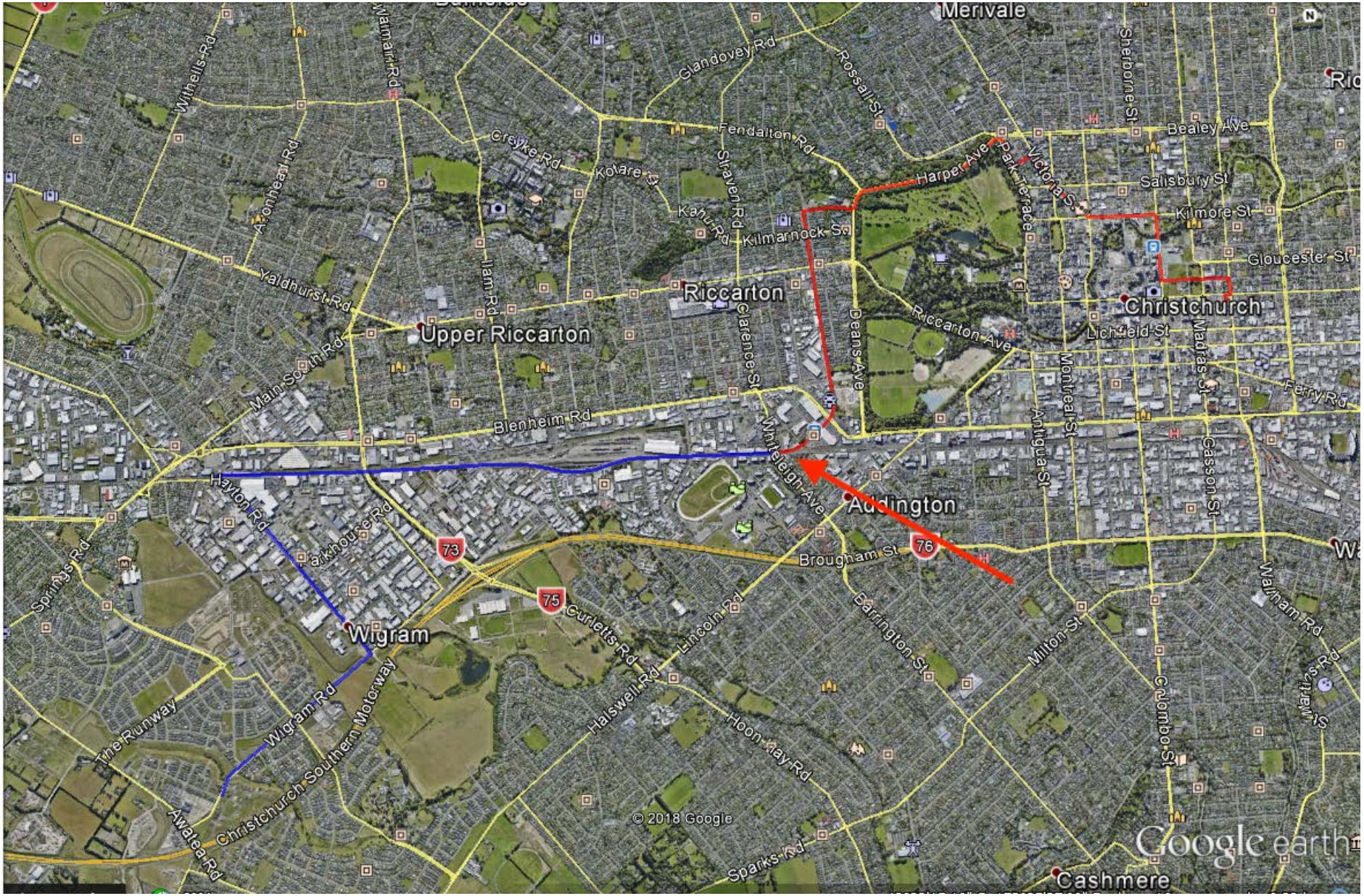
CONNECTIVITY EXAMPLES

- Lincoln PoP
- Napier-Gisborne
- Cook Strait

LINCOLN POP


CRT
CHC
LCN

CRT


Merivale
Riccarton
Upper Riccarton
Christchurch
Addington
Wigram
Cashmere
Withells Rd
Waimairi Rd
Glandovey Rd
Rossall St
Sherborne St
Bealey Ave
Fendalton Rd
Creyke Rd
Kotare
Kahu Rd
Kilmarnock St
Harper Ave
Park Terrace
Victoria St
Salisbury St
Kilmore St
Gloucester St
Avonhead Rd
Yaldhurst Rd
Main South Rd
Clarence St
Deans Ave
Riccarton Ave
Lichfield St
Montreal St
Madras St
Ferry Rd
Blenheim Rd
Whiteleigh Ave
Antigua St
Gasson St
Hayton Rd
Parkhouse Rd
Springs Rd
Brougham St
Curletts Rd
Lincoln Rd
Barrington St
Milton St
Waltham Rd
Halswell Rd
Hoon Hay Rd
The Runway
Wigram Rd
Christchurch Southern Motorway
Awatea Rd
Sparks Rd
St Martins Rd
Lombo St
73
75
76
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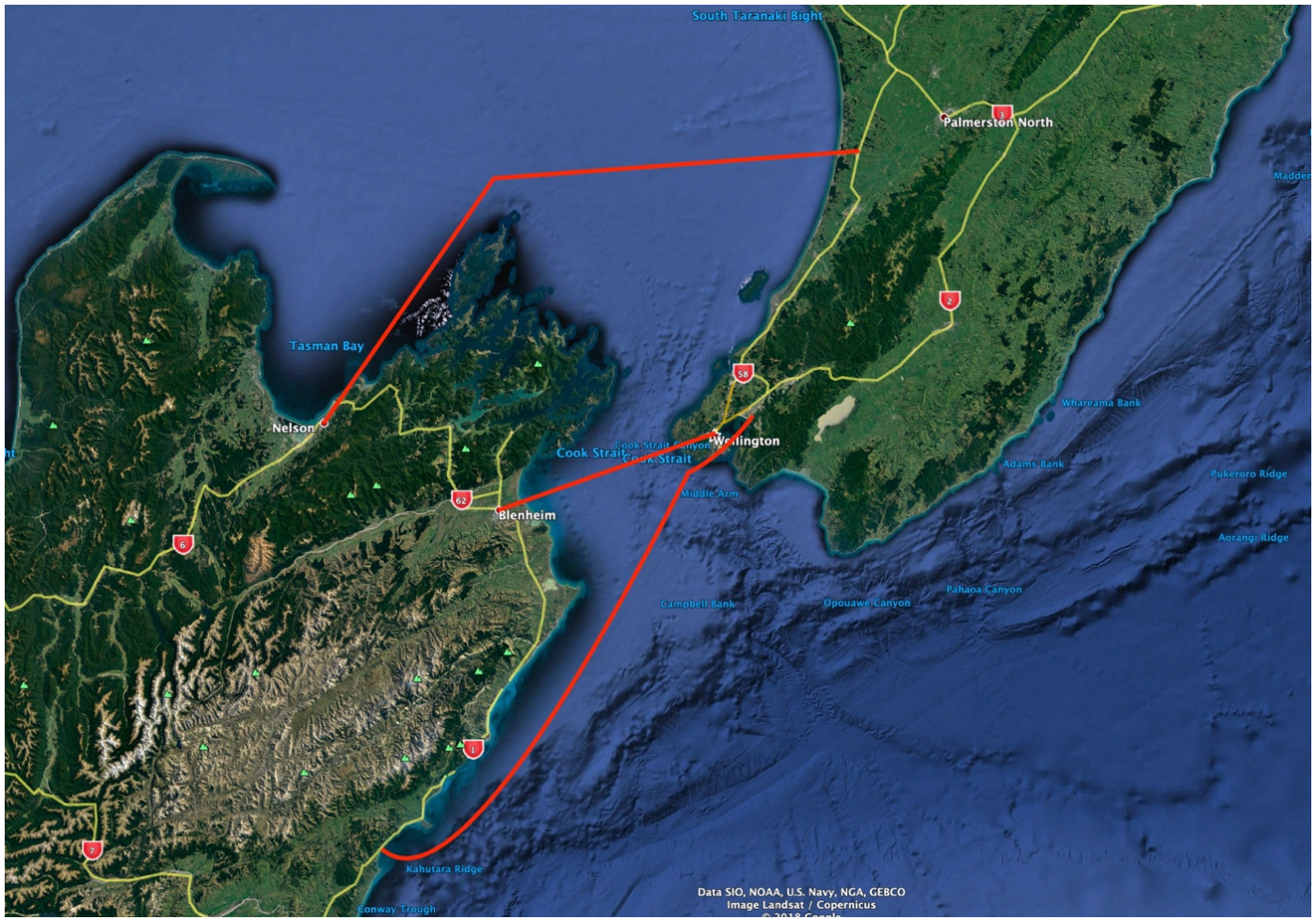
HAWKES BAY – POVERTY BAY

COOK STRAIT


South Taranaki Bight
Palmerston North
Tasman Bay
Nelson
Wellington
Cook Strait
Blenheim
Whareama Bank
Adams Bank
Pukeroro Ridge
Middle Arm
Aorangi Ridge
Pahaoa Canyon
Campbell Bank
Opouawe Canyon
Kahutara Ridge
Conway Trough
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

A FINAL OBSERVATION ABOUT FIBRE PATHS

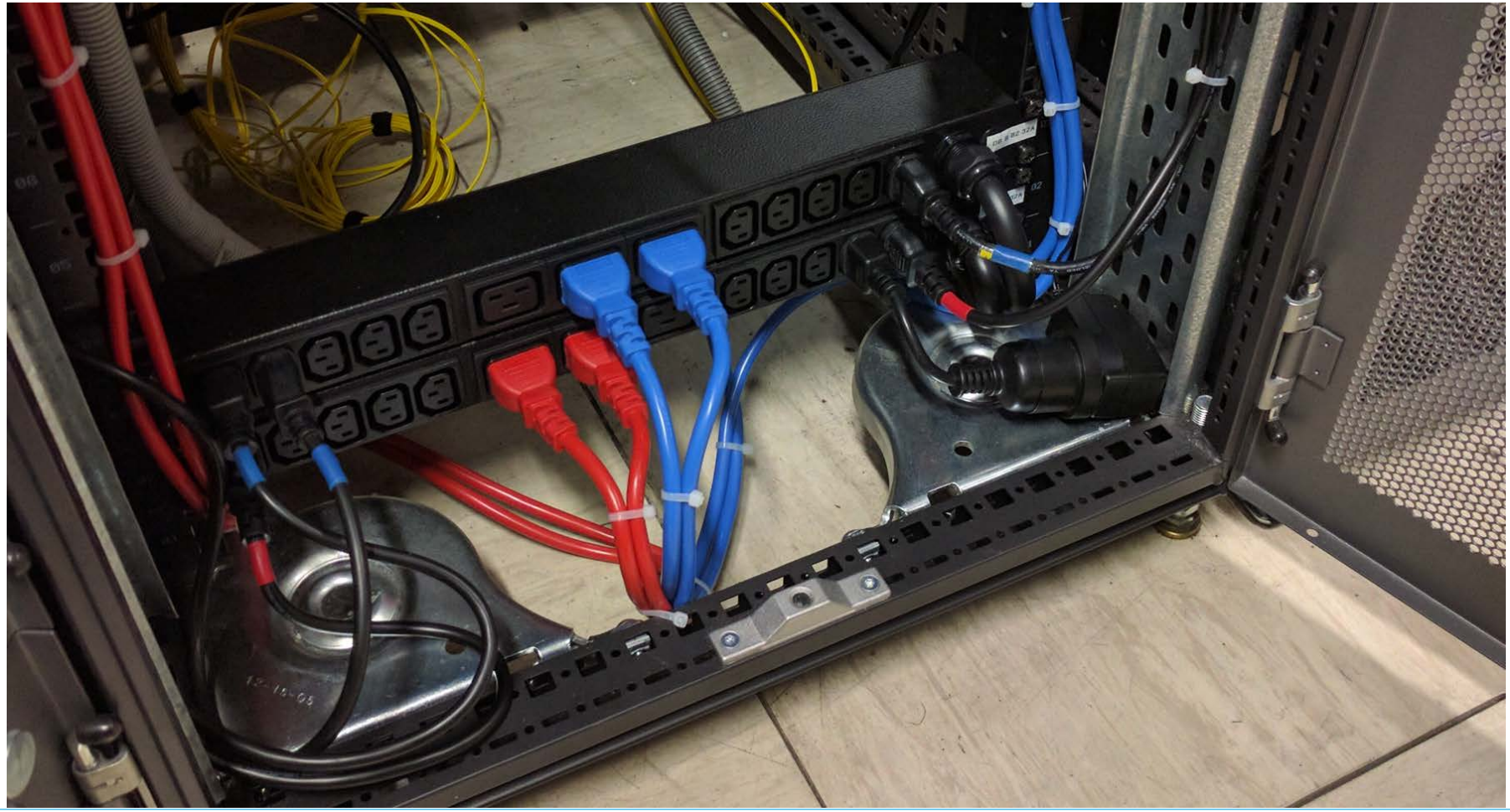
REANNZ POP - POWER

- Diverse power feeds on separate infrastructure
- Backed by UPS
- Backed by Generator
- DC Power capable equipment
- Correctly identified and delivered in a way that allows for clear understanding of power usage

REANNZ MX480 DC SYSTEM

REANNZ MX480 AC SYSTEM

REANNZ AC CABLING



REANNZ POP - HARDWARE

- Key sites have redundant
  - Routing engines (RE's)
  - Switch fabrics (SCBE's)
  - Power modules (PEM's)
  - Line cards (FPC's)
  - Interface cards (MIC's)

- As sites get smaller the routers have fewer redundant components

REANNZ POP – MX480

REANNZ POP – MX80

REANNZ POP – MX104

WHAT CAN YOU TAKE AWAY FROM WHAT REANNZ HAS LEARNED

- Have a clear understanding of the goal
- Understand the physical infrastructure beneath any services purchased
- Understand power delivery and how your equipment consumes power
- Plan for components or systems to fail and think about how long it will take to deploy spares – test this if possible
- Understand and document your risks. Not everything can be mitigated or should be. Cost vs Risk vs Requirements.

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