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The Numbers

Christchurch has suffered three earthquakes over 6.0 in the last 12 months

- .7.1 September 4th 2010 4:35am 10 kms deep
- .6.3 February 22nd 2011 12:51pm 5 kms deep
- .6.3 June 13th 2011 2:20pm 6 kms deep

and over
8,000
Aftershocks

Over 1,000 commercial buildings have been or are in the process of being demolished and approx. 10,000 residential buildings will need to be demolished.

Over 350,000 cubic tonne of liquefaction has been dumped.

The CBD basin has dropped over 500mm

The Port Hills have risen over 450mm

The Brighton Beach sand dunes have moved east in excess of 1,500mm

It cost the lives of 181 people and 164 seriously injured



facebook®

“Honey I love it when you make the earth move for me.... but isn't this a bit ridiculous???”

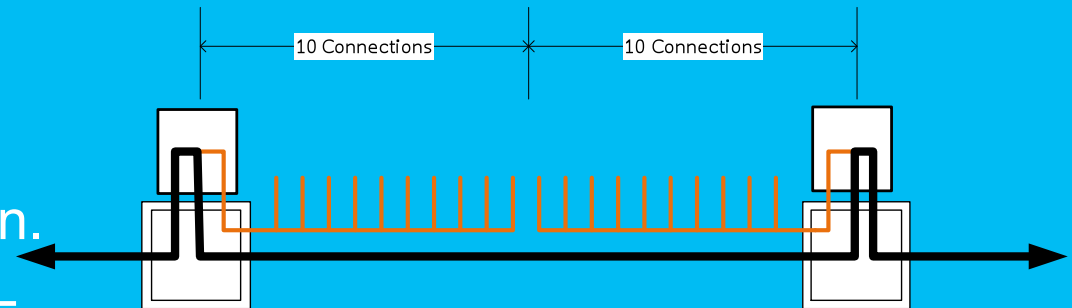
“Hey 40 times in the last 24 hours.... that isn't ridiculous its legendary !!!”

Who is Enable Networks

- .Started in 2007 and owned by Christchurch City Holdings Limited which is the commercial arm of the City of Christchurch.
- .To date have deployed over 320 kms of fibre going past 80% of businesses with 6 or more employees.
- .Have connected over 650 buildings in the city of which 280+ are connected via 1Gbps P2P Ethernet tails.
- .EnableSchools launched in 2008 to date has connected 60+ schools to the network.
- .Are an Open Access Network Provider where all customers gain access on the same published terms and conditions.
- .Started supplying only EnableFibre dark fibre services but in September 2009 launched EnableEthernet layer two metro Ethernet services.
- .Announced in May 2011 as the Crown Fibre Holders partner to deliver FTTH to Christchurch & surrounds.

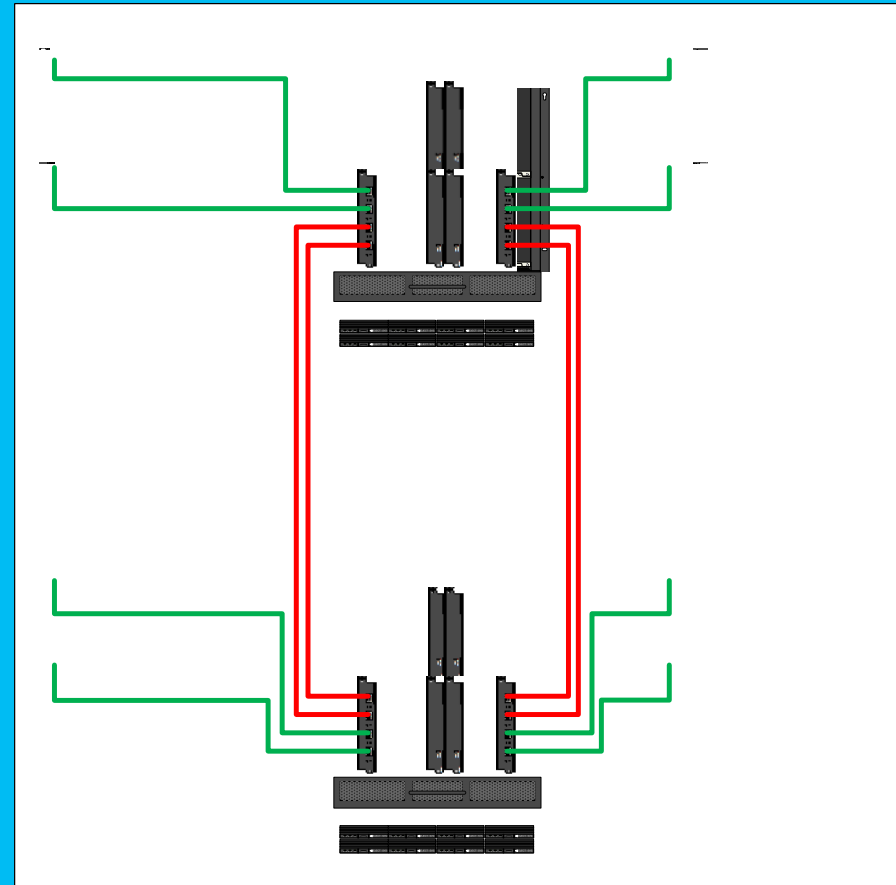
Network Architecture Layer 1

- .Hub/Spoke/Ring network design
- .100% underground network
- .85% directionally drilled installation.
- .Draka JetNetXS micro ducted ABF
- .Sika aluminium chambers.
- .Maximum distance between chambers 350m
- .40m loop left in every chamber.



Network Architecture Layer 2

- .Dual core router sites located within physically diverse Data Centres (CBD, West)
- .Brocade MPLS Carrier Ethernet Solution.
- .Brocade NetIron MLX-16 routers providing a multi-10GE MPLS core.
- .Brocade NetIron CES2048FX edge switches delivering GE to the CNI.
- .Brocade Ironview for NMS



The Power of the Earthquake



The Power of the Earthquake



The Power of the Earthquake



The Power of the Earthquake



Infrastructure Failure

0%

Failure



No fibre cuts in access, junction or back haul networks.

No failure in the Brocade core and edge networks. Circuits automatically came back on when power was restored to customer buildings.

How Did It Happen?

Product Choice,
Network Design,
and Luck!!!



How Did It Happen?

The screenshot shows the Brocade VLL Manager interface. The main window displays a table of VLL configurations. Below the table, there are sections for 'Details', 'VLL Settings', and 'Endpoint settings'.

VCID	Name	Status	Conflict	A Endpoint	Z Endpoint
5209	3T_To_APKL(1184)	All peers are up	None	Net 24 13 [10.0.1.13]ethernet/26	Net 24 11 [10.0.1.11]ethernet/29
	3T_To_CPLS(1092)	All peers are up	None	Net 24 11 [10.0.1.11]ethernet/29	Net 24 11 [10.0.1.11]ethernet/38
5248	3T_To_ETTR(1316)	All peers are up	None	Net 24 11 [10.0.1.11]ethernet/29	HPDC 13 [10.0.2.13]ethernet/23
5192	3T_To_HGSM(11272)	All peers are up	None	Net 24 11 [10.0.1.11]ethernet/29	HPDC 13 [10.0.2.13]ethernet/10
5200	3T_To_HGMH(11345)	All peers are up	None	Net 24 11 [10.0.1.11]ethernet/29	HPDC 13 [10.0.2.13]ethernet/10
5122	3T_To_MSLH(1216)	All peers are up	None	HPDC 11 [10.0.2.11]ethernet/32	Net 24 11 [10.0.1.11]ethernet/29
5213	3T_To_SBR(1289)	All peers are up	None	HPDC 11 [10.0.2.11]ethernet/15	Net 24 11 [10.0.1.11]ethernet/29
	3T_To_SMRD(13140)	All peers are up	None	Net 24 11 [10.0.1.11]ethernet/16	Net 24 11 [10.0.1.11]ethernet/29
5096	3T_To_SSED(1135)	All peers are up	None	Net 24 13 [10.0.1.13]ethernet/7	Net 24 11 [10.0.1.11]ethernet/29
5211	BTB_To_AMVS(1218)	All peers are up	None	Net 24 14 [10.0.1.14]ethernet/12	Net 24 13 [10.0.1.13]ethernet/41
5299	BTB_To_BOMK(1305)	All peers are up	None	Net 24 13 [10.0.1.13]ethernet/41	HPDC 13 [10.0.2.13]ethernet/07
5150	BTB_To_BMDM(1220)	All peers are up	None	Net 24 14 [10.0.1.14]ethernet/19	Net 24 13 [10.0.1.13]ethernet/41
5218	BTB_To_CDM(1225)	All peers are up	None	Net 24 14 [10.0.1.14]ethernet/8	Net 24 13 [10.0.1.13]ethernet/41
5139	BTB_To_COCM	All peers are up	None	Net 24 14 [10.0.1.14]ethernet/18	Net 24 13 [10.0.1.13]ethernet/41
5196	BTB_To_BMOS(1232)	All peers are up	None	HPDC 11 [10.0.2.11]ethernet/39	Net 24 13 [10.0.1.13]ethernet/41
5210	BTB_To_BPMV(1352)	All peers are up	None	Net 24 14 [10.0.1.14]ethernet/41	Net 24 13 [10.0.1.13]ethernet/41

Details

VLL Settings

Name: 3T_To_APKL(1184) | VLL Mode: Tagged | Status: All peers are up

Local VLL: | VCID: 5209

Endpoint settings

A Endpoint

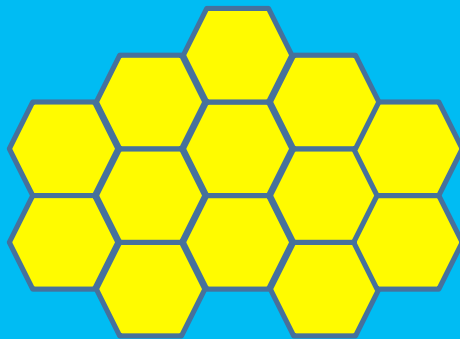
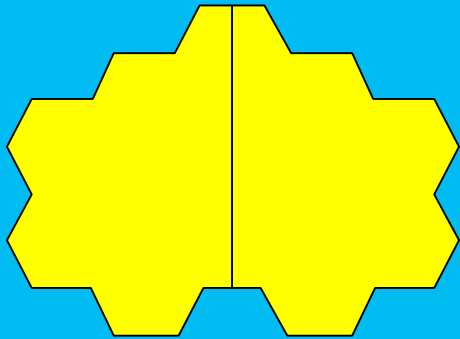
Name: 3T_To_APKL(1184) | COS: | VLL Mode: Tagged | Tag Mode: Tagged | L2 Status: UP | PW Status: UP

Z Endpoint

Name: 3T_To_APKL(1184) | COS: | VLL Mode: Tagged | Tag Mode: Tagged | L2 Status: UP | PW Status: UP

- Brocade MPLS Core.
- Simple Network Design.
- IP PnP System.

What Would/Will We Change?



- The network today is currently two cells which have the ability to fail over to each other.
- We survived because of the resiliency of the network products deployed, more than the design.
- Decentralise layer 1 and 2 networks further, but not too far.
- Find the balance of increasing resiliency and reducing complexity.

Kia kaha

(*Forever Strong*)