Using RPSL in the New Zealand Internet Exchanges

Andy Linton <asjl@citylink.co.nz>

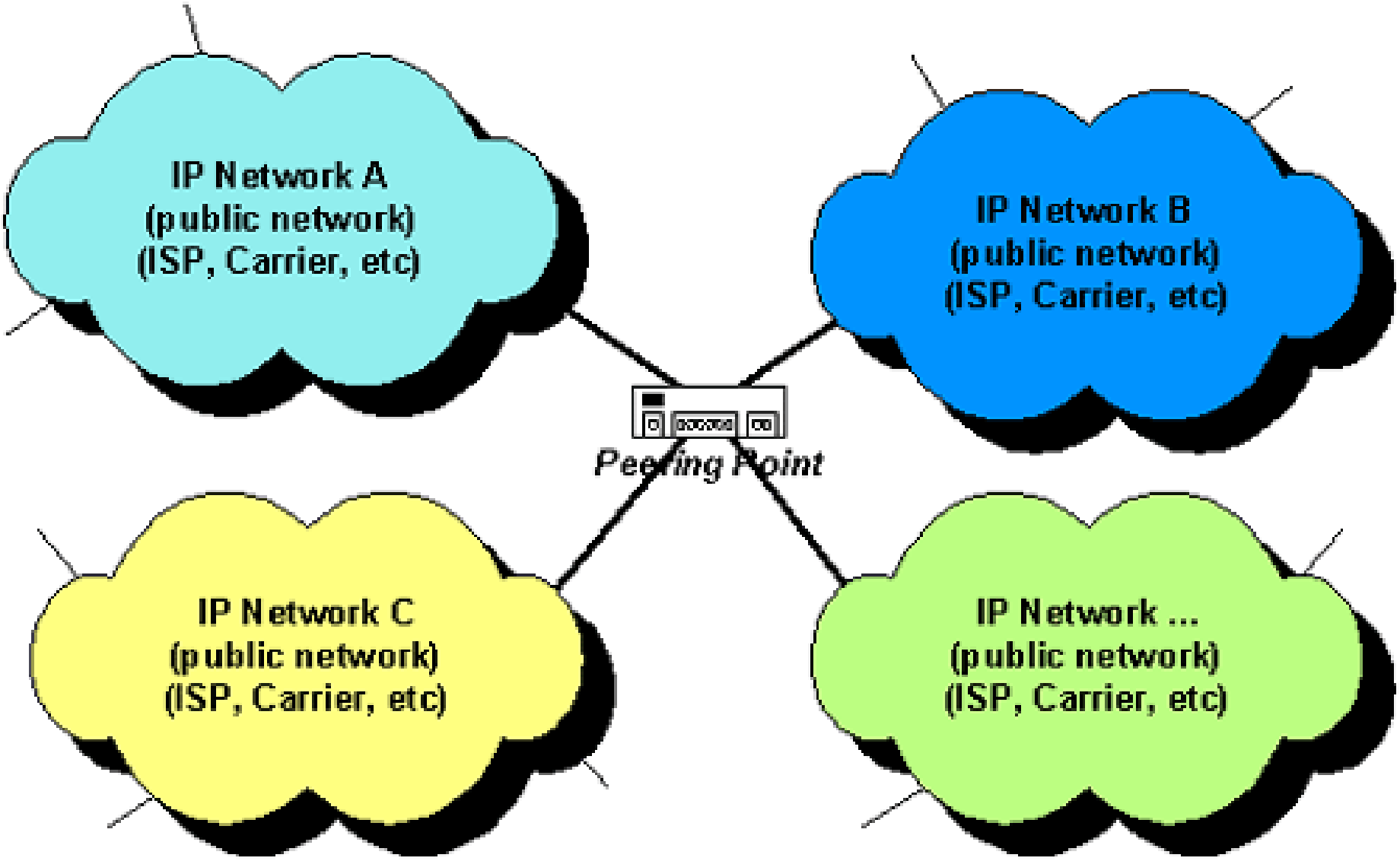
February 2004

New Zealand Peering Exchanges

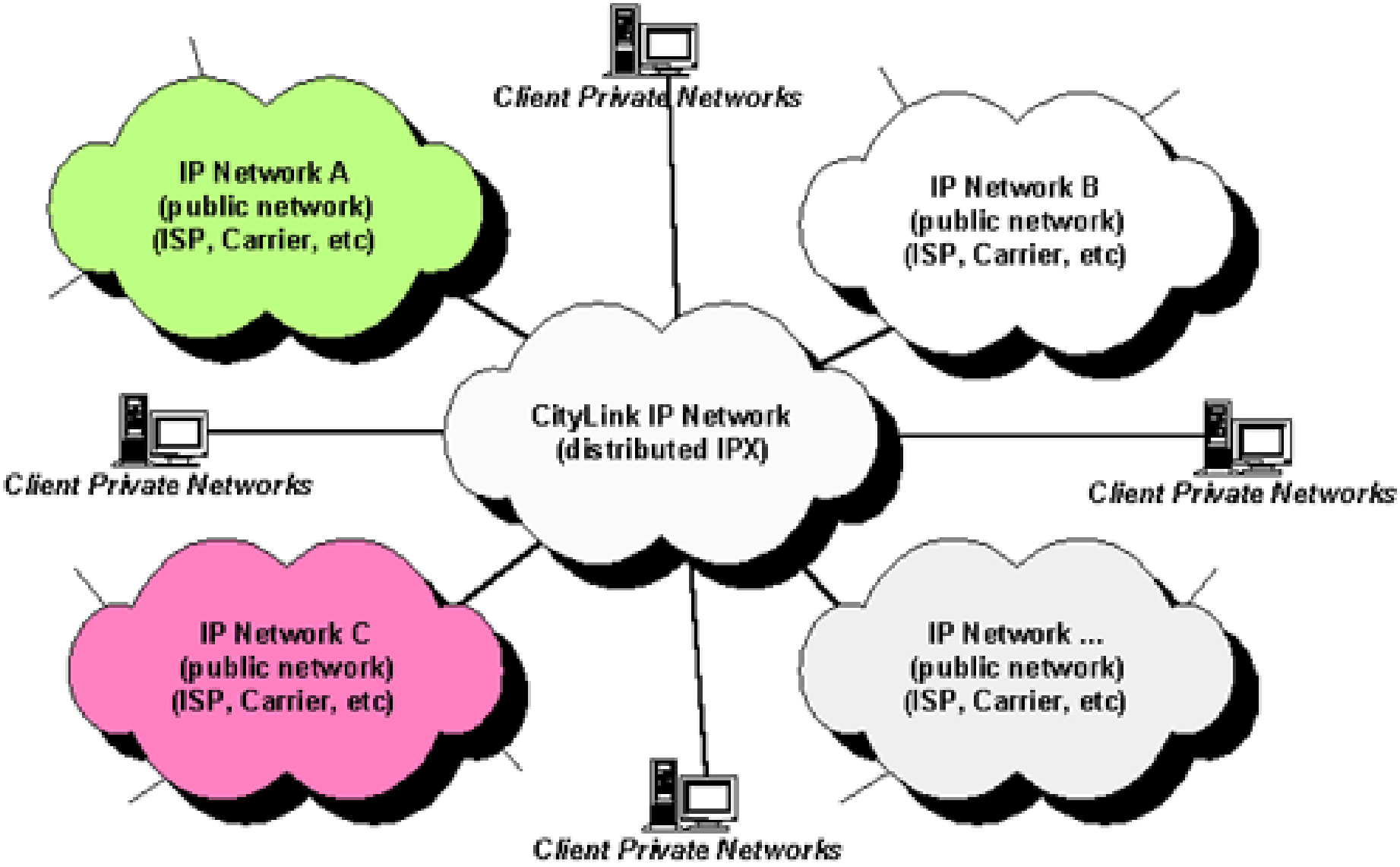
- Currently in Auckland and Wellington
  - Auckland Peering Exchange – APE
  - Wellington Internet Exchange – WIX

- Proposed for Hamilton, Christchurch
- Possible for Palmerston North, Dunedin, Hawkes Bay

Traditional Peering Environment



WIX Distributed Peering Environment



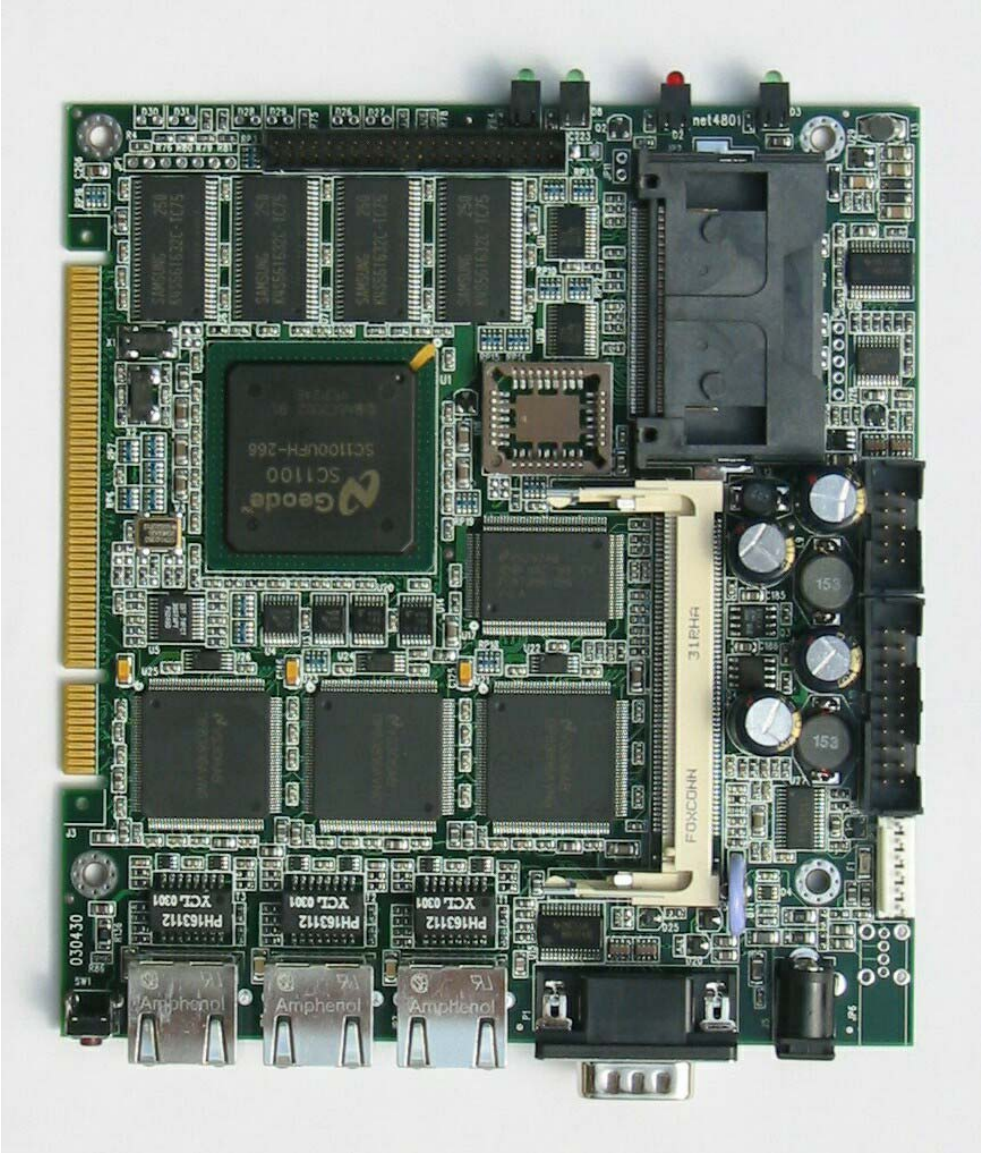
WIX Switches

- Highly distributed switch fabric
- 60+ Cisco switches with connections to 300+ buildings in Wellington CBD
  - 35xx, 29xx
- Connections at 10, 100, 1000 Mbps

WIX Peers

- Currently over 120 peering sessions with the WIX route servers
  - Smallest prefixes announced - /29
  - 41 peers have public AS numbers
  - 85 peers have private AS numbers
- We operate our own route registry
  - http://www.wix.net.nz/cgi-bin/whois.pl
- We use RPSL to manage all IPv4 route servers
- Looking glass available
  - http://www.wix.net.nz/cgi-bin/mrlg-wix.cgi

Route Servers



- 266 Mhz 586 class processor from www.soekris.com
- Uses LEAF code - leaf.sourceforge.org
- Quagga Routing Suite - www.quagga.net

BGP configuration

- Two route servers which need to be identical
  - Config is currently 131471bytes and 4931 lines long
- We need tight control on what each peer can announce to the servers
- If a server fails we need to be able to build a replacement quickly
- All this needs to be open and transparent

BGP policy

- Each peer can announce only their networks to the route servers
- Route servers manipulate data in several ways
  - remove private AS details
  - filter bogons and default (just in case)
  - advertise all routes learnt with a *no_export community*
- *Policy is made visible to community*
  - *whois -r -h whois.wix.net.nz as9439*

AS9439 aut-num object

```
aut-num:      AS9439
import:       from AS9439:AS-PRIVATE
              accept AS9439:RS-ROUTES:PeerAS
import:       from AS9439:AS-PUBLIC
              accept AS9439:RS-ROUTES:PeerAS
export:       to AS9439:AS-PRIVATE
              action community = { no_export };
              announce ANY AND NOT {0.0.0.0/0}
              AND NOT fltr-bogons
export:       to AS9439:AS-PUBLIC
              action community = { no_export };
              announce ANY AND NOT {0.0.0.0/0}
              AND NOT fltr-bogons
```

AS9439:AS-PUBLIC

as-set: AS9439:AS-PUBLIC
descr: Public ASes for NZRR
members: AS42
members: AS24005
members: AS23959
members: AS23905
members: AS23977
members: AS2687
members: AS23755
members: AS23904
members: AS9727
members: AS681
.....

AS9439:RS-ROUTES:AS23754

route-set: AS9439:RS-ROUTES:AS23754
descr: Route set for Citylink to NZRR
members: 203.97.231.224/28,
210.48.103.0/28,
210.48.103.144/28,
210.48.103.136/29,
203.118.144.0/24^24-29,
202.37.19.0/24,
198.48.0.0/22,
202.7.4.0/24,
202.8.44.0/22
source: NZRR

fltr-bogons

- Formed by combining two other filter-sets
  - fltr-unallocated OR fltr-martian
- Based on the work of Rob Thomas. See:
  - http://www.cymru.com/Documents/bogon-list.html

fltr-martians

```
filter-set:   fltr-martian
filter:       {
              0.0.0.0/8^+ ,
              10.0.0.0/8^+ ,
              127.0.0.0/8^+ ,
              169.254.0.0/16^+ ,
              172.16.0.0/12^+ ,
              192.0.2.0/24^+ ,
              192.168.0.0/16^+ ,
              198.18.0.0/15^+ ,
              224.0.0.0/3^+
              }
```

fltr-unallocated

```
filter-set:   fltr-unallocated
filter:       {1.0.0.0/8^+,
              2.0.0.0/8^+,
              5.0.0.0/8^+,
              7.0.0.0/8^+,
              23.0.0.0/8^+,
              27.0.0.0/8^+,
              31.0.0.0/8^+,
              36.0.0.0/8^+,
              37.0.0.0/8^+,
              39.0.0.0/8^+,
              41.0.0.0/8^+,
              42.0.0.0/8^+,
              ........
```

How does all this help?

- We have software that reads a list of peers, extracts the relevant data from the Route Registry and generates a BGP config file
- Data file looks like:

- 202.7.0.1:23754:Citylink:passive
- 202.7.0.7:23754:Citylink:passive
- 202.7.0.8:23755:Citybridge:passive
- 202.7.0.48:64585:NRG:passive
- 202.7.0.49:2687:ATT:passive
- 202.7.0.50:17412:WalkerWireless:

Software details

- A set of ***shell*** and **perl** scripts that call RtConfig to construct a Cisco/Zebra/Quagga bgpd.conf file
- Can also produce Juniper code
- Managed using **make** and **RCS to provide backups and consistency**
- **Not a polished software distribution – site specific but available on request**

What's next?

- IPv6 peering also available in both locations
  - Small number of peers so far so configs done by hand
  - RPSLng is close to standardisation and Rtconfig is available to manage IPv6 policy
  - When manual load gets too high, we'll do this for IPv6 as well

Questions?