APNIC26 Network

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Network Details

- Dark fibre:
  - § 1Gbit/s from FX Networks' Christchurch POP to Conven Centre
  - § 1Gbit/s from Convention Centre to Crowne Plaza
- Transit:
  - § 20Mbit/s domestically
  - § 10Mbit/s international
- Hardware:

What went wrong?!

- ⤷ Rogue IPv6 RA

- ⤷ IPv6 RA leakage

- ⤷ IPv6 MTU/Fragmentation

- ⤷ IPv6 prefix reach-ability not so good in Europe

- ⤷ Wireless Interference

- ⤷ Venue coffee not up to scratch

IPv6 Rogue RA

- During the first day, a rogue RA was noticed.
    - § Sharing both a 6to4 tunnel, and their own 6over4 tunnel
    - § It appeared to all clients to be native connectivity.
    - § Clients were preferring these routes over the conference network due to the route selection.
- To fix this issue, we had to;
    - § Track down the MAC address.
        - tcpdump/wireshark are helpful.

Router —— Trunk —— **Switch**

Switch —— Trunk —— **Xirrus**
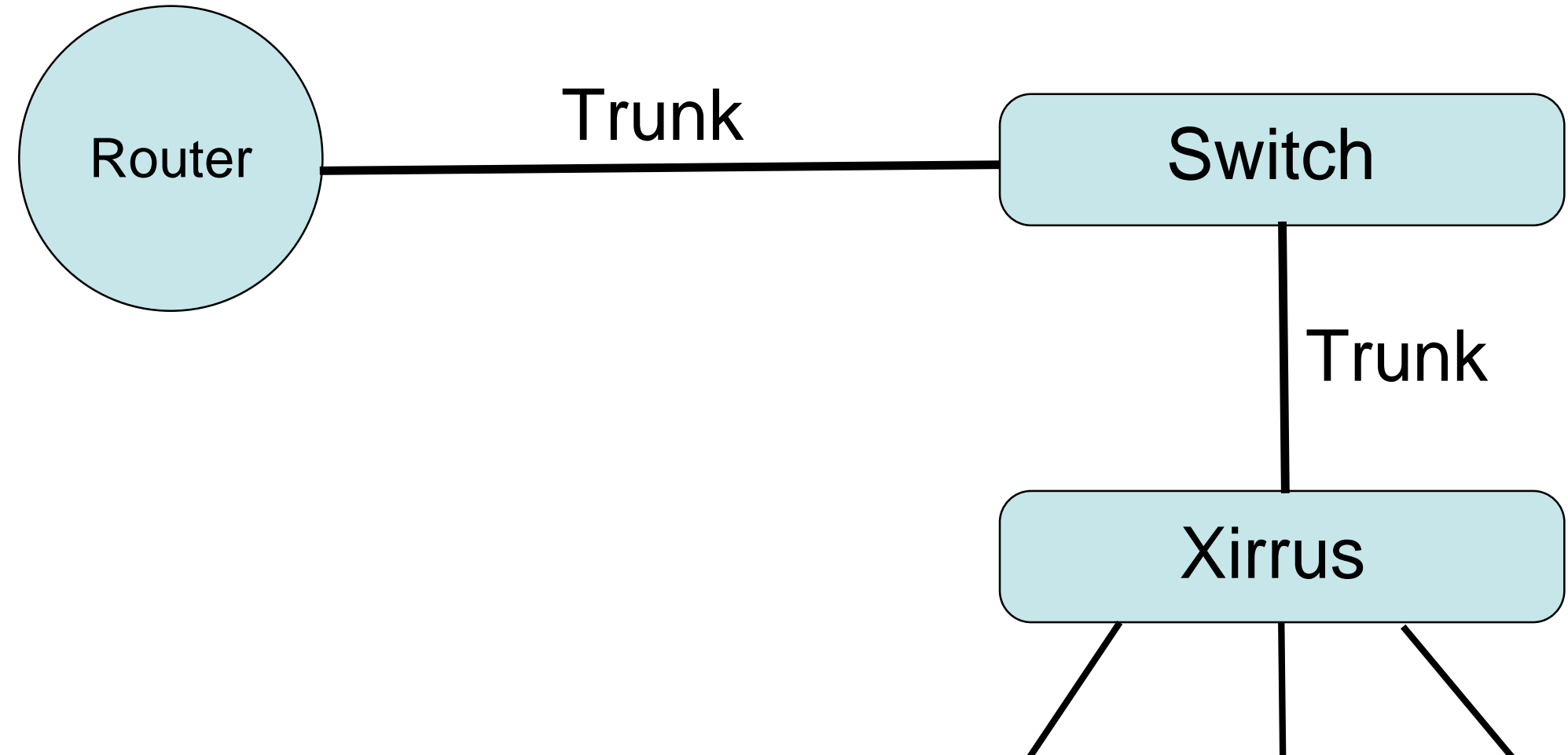
IPv6 RA Leakage

↪ IPv6 RA leakage

§ The Xirrus radio was leaking IPv6 RA between the VLAN

• This caused issues with machines having three subne
locally connected, and were not always sourcing the I
traffic from the correct interface.

§ Upgraded the radio software to allow "IPv6 passthrough

§ Ultimately, ran a single IPv6 network through the radio.

IPv6 MTU/Fragmentation

⇥ During the test, some sites didn't work, such as www.kame.net.

§ This was due to the internal IPv6 network being configur with a 1500 Byte MTU, and a tunnel that had an encaps size of the same. Not going to work without fragmentatio

⇥ Solutions

§ Native IPv6 connectivity.

§ Ch th i t l t k t IP 6 MTU th t ill fit b

Wireless Hardware

↪ Main Conference room

- § Xirrus XS8 Wireless Array "UFO"
- § One giant array, eight radios managed as a whole
- § 4x 802.11a/b/g radios
- § 4x 802.11a radios
- § Coverage from many non-overlapping channels
- § It should work well for several hundred users!
- § Thanks to CityLink for the hardware

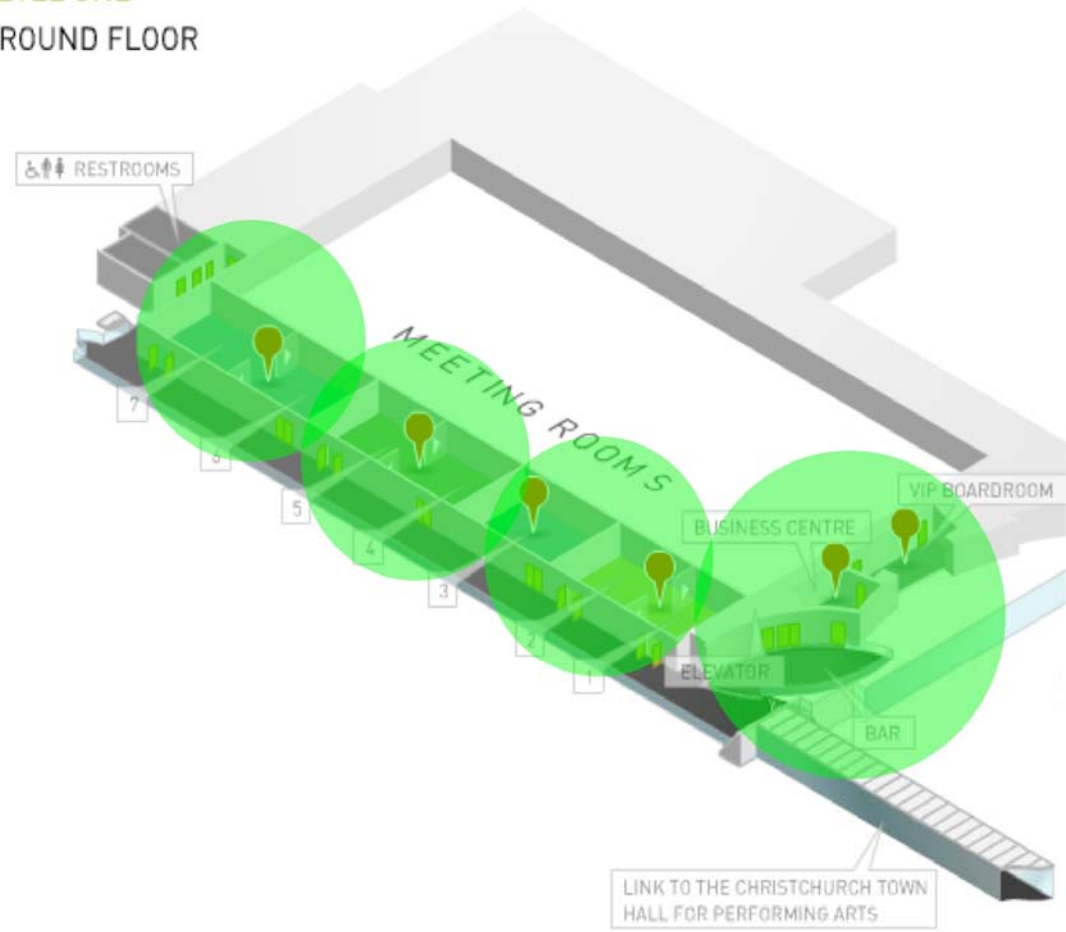Multiple Wi-Fi Radios Produce 864Mbps of Bandwidth

Wi-Fi Controller
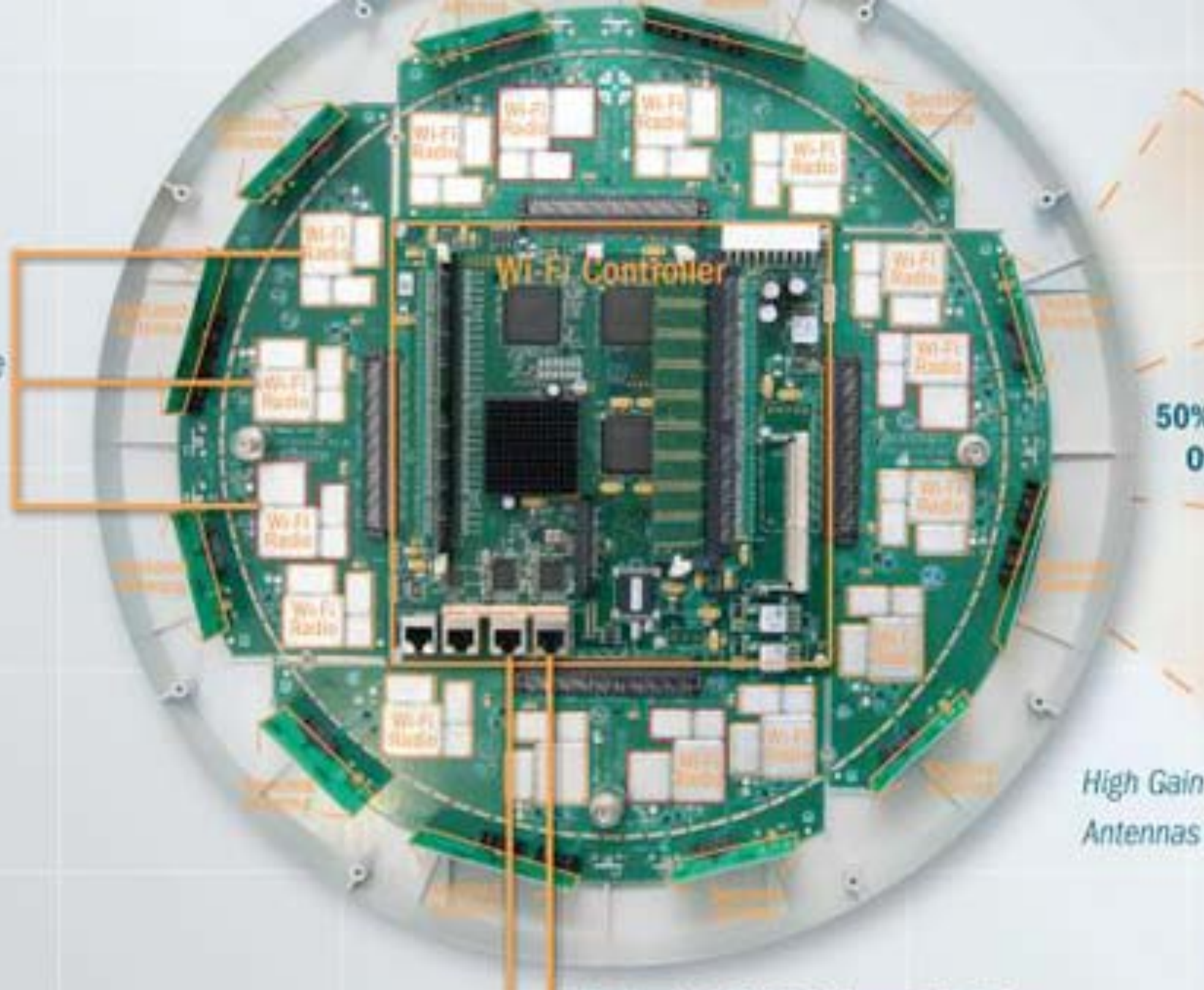
50%

High Gain Antennas

Initial Configuration
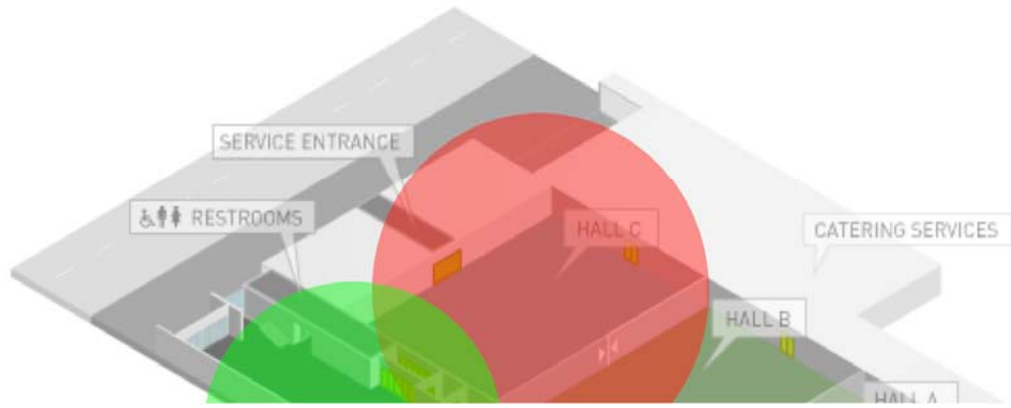
'APNIC' v4 only SSID being turned OFF!

Mikrotik Radios
'APNIC' v4 only SSID

GROUND FLOOR

RESTROOMS

7

5

3

MEETING ROOMS

VIP BOARDROOM

BUSINESS CENTRE

ELEVATOR

BAR

LINK TO THE CHRISTCHURCH TOWN
HALL FOR PERFORMING ARTS

LEVEL ONE
GROUND FLOOR

SERVICE ENTRANCE

RESTROOMS

HALL C

CATERING SERVICES

HALL B

HALL A

Wireless Interference

- What was observed?
  - § Intermittent connectivity, but aren't all the best problems
  - § Huge latency spikes; 2000ms+ RTT to the router.
  - § Generally rubbish performance.
- How did we debug this?
  - § WiSPY USB dongle and EaKiu software
    - http://www.metageek.net/
    - http://www.cookwareinc.com/EaKiu/

Wireless Interference
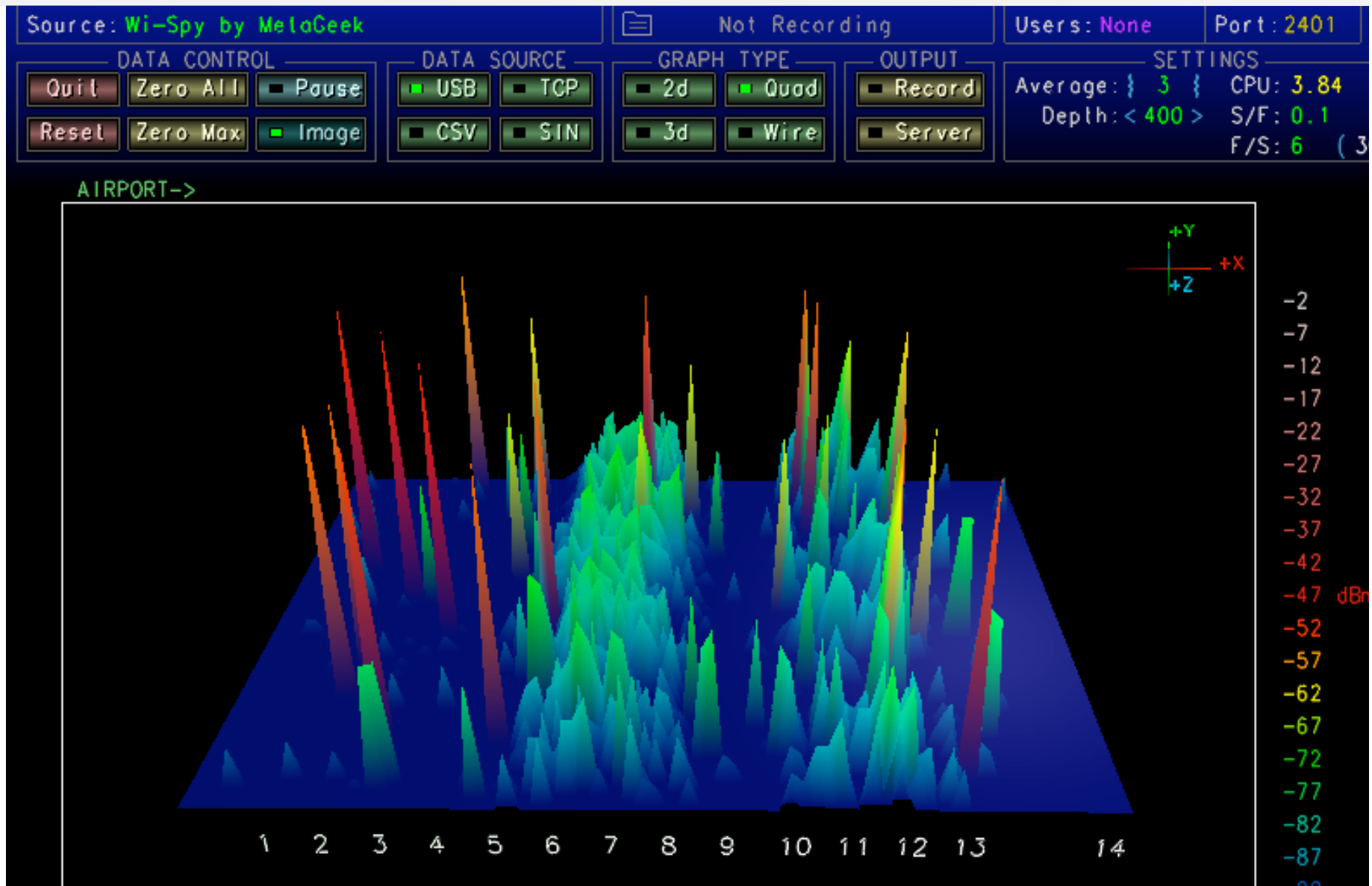
→ 802.11a 5GHz spectrum performing much better 2.4GHz

- § SSID APNIC26 = 802.11b/g only
- § SSID AAPNIC26 = 802.11a only
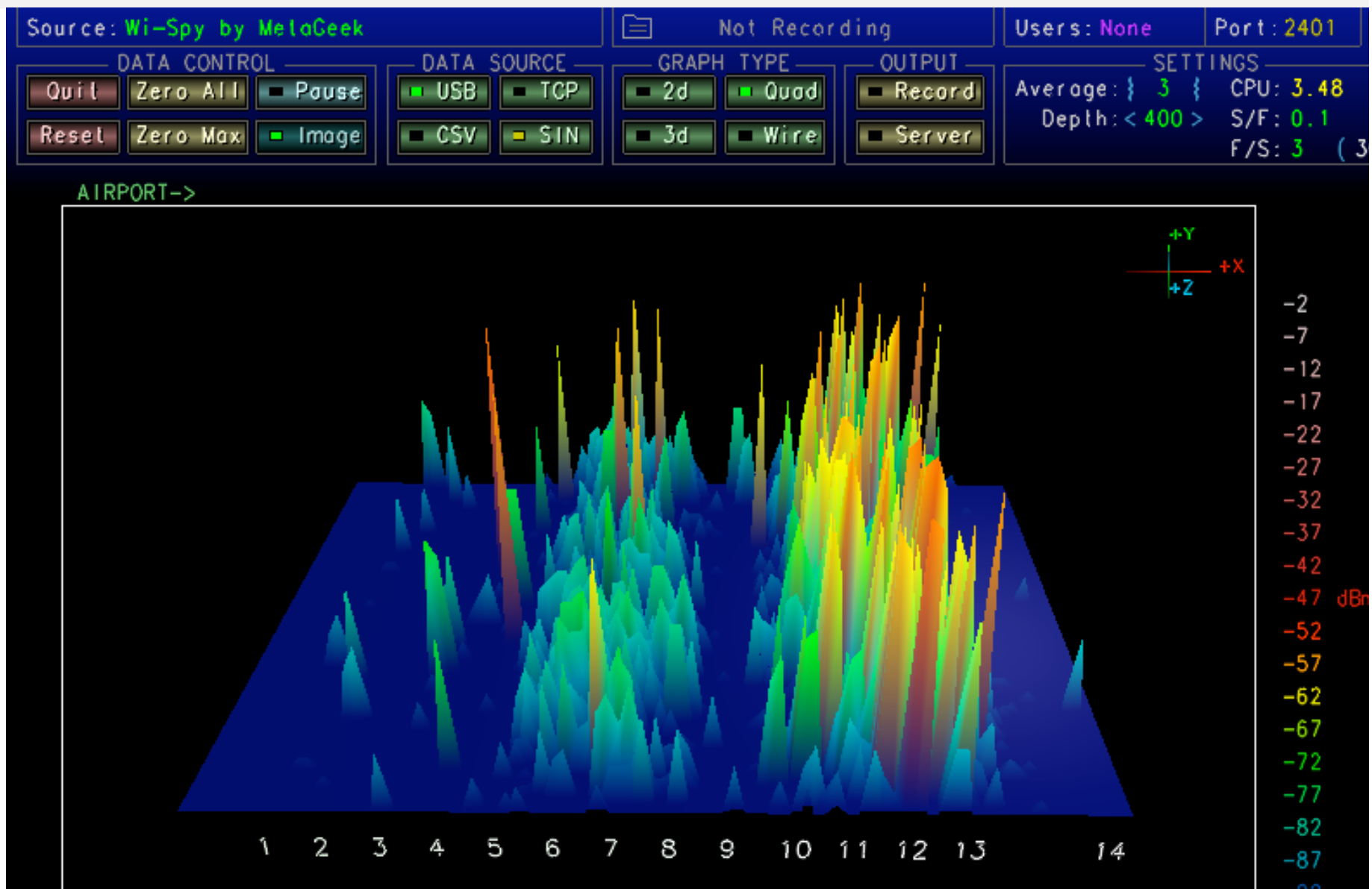- § many clients seem to prefer an 802.11b/g signal over 80
  - the different SSIDs allow users to explicitly select the 8 signal
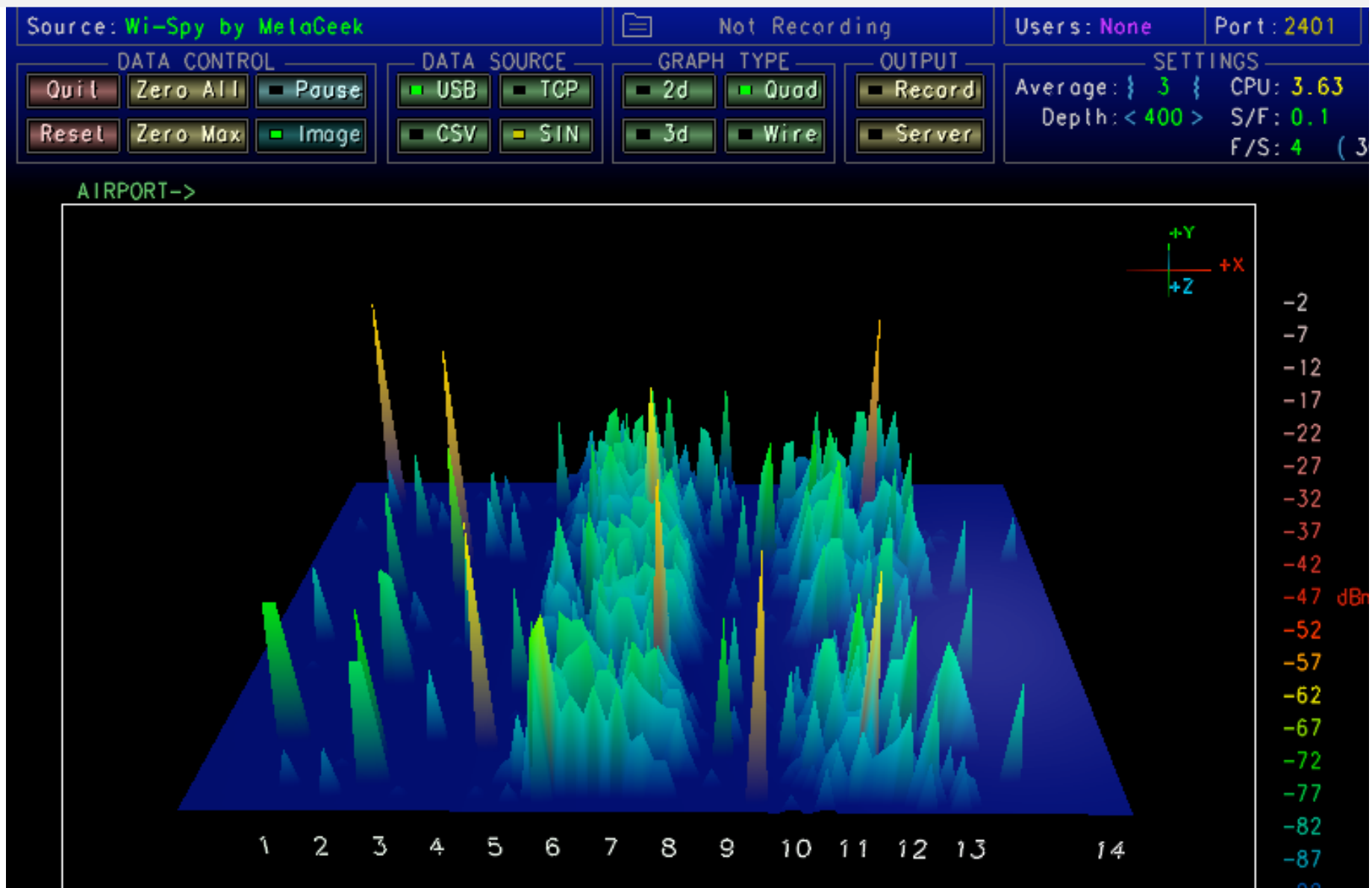
→ 2.4GHz performance

Wireless Interference - bad

Wireless Interference - bad
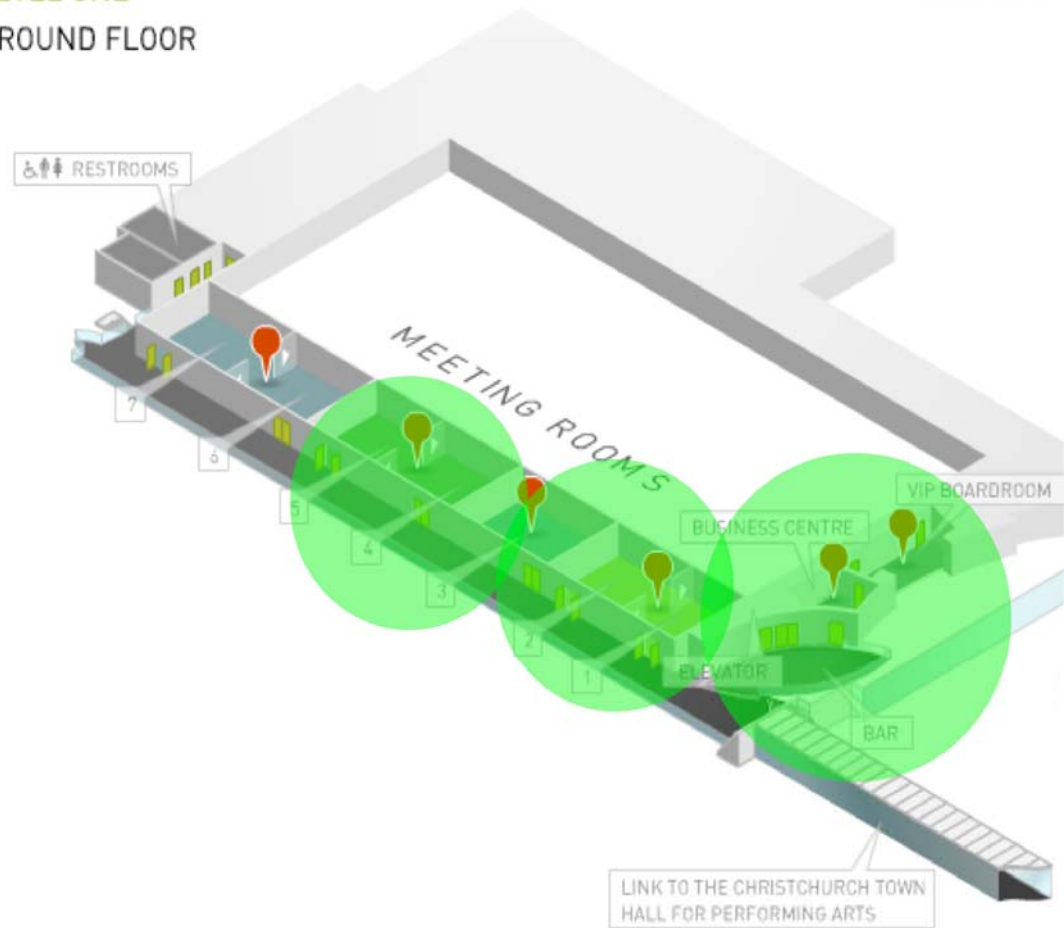
Wireless Interference - ok

Current Deployment

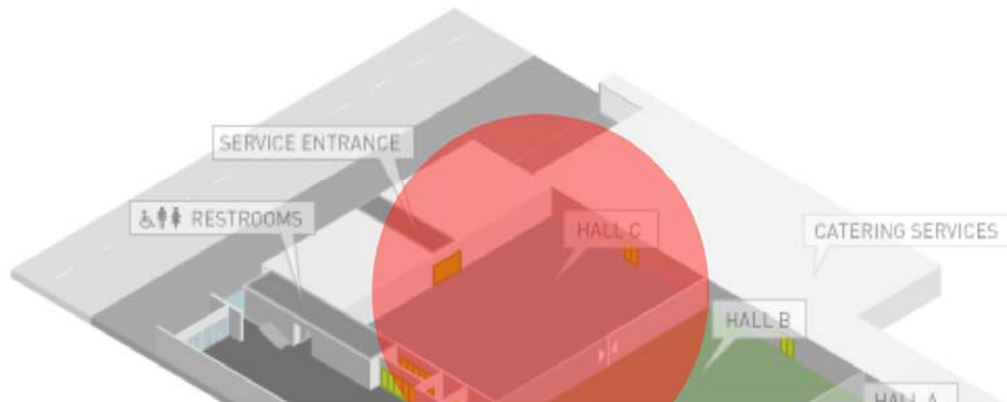Xirrus Radio

'APNIC' v4 only SSID being turned OFF!

Mikrotik

'APNIC' v4 only SSID being left on

Network Stats

- 100 - 130 stations attached to AP here in Hall C
  - § I counted only around 75 laptops out - presumably the re iPhones etc.
  - § ~60% 802.11a
  - § ~40% 802.11b/g
- Peaks of 10.5Mbit/s downstream
  - § ~90% international
  - § ~10% domestic

Graphs

→ http://kiwi.apnic.net/mrtg

Things to think about

→ Need a backup plan for wireless-fail

§ back to cat-5 drops?

→ Will we reach a point were 802.11abg is complet
unusable at large meetings?

→ Having consistent equipment and setup from me
to meeting would be a mighty good thing

§ router setup and IP ranges

§ conference noc server - lots of useful tools, mrtg, nfsen