VoIP in New Zealand

Jonny Martin
Citylink

jonny@citylink.co.nz

Citylink

- Small fibre provider in Wellington and Auckland
- Connect ~350 buildings in Wellington
- Provide dark fibre and 10/100/1000 ethernet services
- True ‘pipe’ provider
- Run several internet exchanges in NZ
- Run CafeNET, one of the country’s largest public WiFi networks

Agenda

- Current telecommunications landscape
- The New Zealand PSTN
- How VoIP is being used
- Current players
- VoIP Peering
- Constructive and destructive activities
- Issues
- ENUM trial

Telecommunications in NZ

- Population 4 million
- Similar land-mass to Japan
- Majority live in about six main cities
- Everyone else spread thinly throughout the rest of the country

Telecommunications in NZ

- Highly de-regulated telecommunications market
- Dominant incumbent: Telecom New Zealand Ltd.
- Telstra-Clear comparatively small ‘wanna-be’ telco
- Bundled Local Loop
- Telecom dictates majority of services
- Lively, if unprofitable, ISP market (> 100 ISPs)
- Apparently we have one of the most expensive and poor performing telecommunications market in the OECD

Voice in NZ

- Free local calling for all Telecom residential lines
- 'KiwiShare' guarantees this as well as ensuring country folks are not disadvantaged
- All voice providers interconnecting with Telecom must contribute to this cost
- Calculated cost of NZD63 million to provide service to uneconomic areas in 2004-2005 year
- Monthly residential line rental: NZD42 (USD30)
- Monthly business line rental: NZD60 (USD42)

PSTN Number Space

- Managed by Number Administration Deed (NAD) members
- Cost NZD10K /year plus an unknown amount to cover cost of number portability
- And a share of the NZD63 million KiwiShare cost
- Telecom has ~90% of allocated numbers

PSTN Number Space

+64 0 access code

+64 1 services

+64 2 Mobile networks

+64 3 South Island area

+64 4 Wellington area

+64 5 Inter-carrier codes

+64 6 Lower North Island area

+64 7 Middle North Island area

+64 8 Toll-free and special services

+64 9 Upper North Island area

PSTN Number Space

+64 2 - Most likely place for a VoIP specific prefix to sit

+64 20	spare
+64 21	Vodafone
+64 22	spare
+64 23	TelstraClear (not currently in use)
+64 240	Telecom (Antarctica)
+64 245	Woosh Wireless
+64 249	Vodafone
+64 25	Telecom
+64 26	Primarily Telecom
+64 270	WorldxChange
+64 27[2-6]	Telecom
+64 281	Econet
+64 288[7-9]	Callplus
+64 29	TelstraClear

PSTN Interconnect

- Wholesale interconnect
  - Requires substantial investment (dollars, time, lawyers)
  - Typically results in a situation where the interconnectee is forced into behaving like a telco due to cost structures
- Retail interconnect
  - Become a customer of an existing telco

VoIP - Just a Technology?

- Two ways to look at VoIP
- Just another technology used to deliver much the same services using much the same model as the circuit switched world - the legacy telco model!
  - E.g. Telecom are spending several billion dollars building an NGN. All voice will be VoIP by 2012
- VoIP the revolution - the internet way of doing things
  - E.g. Skype

Current VoIP Players

- Telecom
- TelstraClear
- Woosh
- Callplus / SlingShot / iTalk
- iHUG
- SipServe
- FX Networks
- Skype
- Me

Telecom

- Provide VoIP PBX and contact centre solutions to business customers
- Migrating entire network to VoIP - the NGN
  - Currently in small scale trials
  - Offer a few new features but otherwise just a replacement for existing voice service
- Using a VoIP as just another technology with a couple of new whizzy features

TelstraClear

- Provide VoIP PBX and contact centre solutions to business customers
- No specific announcements as to future VoIP activities
- Using a VoIP as just another technology with a couple of new whizzy features

Woosh

- Small player offering nationwide wireless internet using IPWireless UMTS technology
- Initially promised a voice service two years ago, launched service Sep 05
  - Had many technical problems with jitter and latency across the RF link
  - Overcome recently by using a separate TDM channel for VoIP traffic
- Customer uses an analog telephone adapter and/or a SIP softphone client

Woosh


5cm
12.5cm
Headset
15.5cm
28cm (including cables)
Software Phone
Modem + Phone Connection Kit

Woosh

- Cost NZD20 /month (USD14) - but you must also sign up for Woosh internet
  - Second phone line NZD15 /month
- Much larger local free calling areas
- Not publicly releasing customer numbers - believed to be around 1000
  - Woosh has around 15000 internet customers
- Customers must get new telephone number - number portability not a reality at this stage

Callplus / Slingshot / iTalk

- Callplus offer business VoIP connections using Broadsoft softwsitch and Cisco handsets
  - VoIP as just another technology
- iTalk - residential Vonage-style service
- SIP based, using open source SIP Express Router (SER)
  - VoIP the revolution
- Cost NZD10/month (USD7)
- Call rates 50-75% cheaper than Telecom standard rates

Callplus / Slingshot / iTalk

- Currently only Auckland +64 9 numbers available
- Talk of expanding into other areas - rumour is that this won't be happening for a while
- Supported endpoints
  - Grandstream Budgetone 101 SIP phone
  - Xten SIP softphone
- Many other SIP devices also work, including Asterisk
- Customers numbers not known - best guess ~1500

iTalk and Asterisk

```
sip.conf
--------
[general]
; register with iTalk, incoming calls passed to 's'
extension
register => 6499742825:*pw*@akl.italk.co.nz

; iTalk SIP peer definition
[italk]
type=friend
secret=*pw*
username=6499742825
fromuser=6499742825
host=akl.italk.co.nz
dtmfmode=rfc2833
insecure=very
nat=no
canreinvite=no
allow=all
```

iTalk and Asterisk

```
extensions.conf
---------------

[default]

; send incoming calls to 's' extension to jonny
exten => s,1,Dial(SIP/jonny)

; send outgoing Auckland calls to iTalk
exten => _09NXXXXXX,1,Dial(SIP/${EXTEN}@italk)
exten => _09NXXXXXX,2,Hangup
```

iHUG

- One of NZ's larger ISPs
- IHUG Connect - residential VoIP service
- Voice service was available to broadband customers on Wired Country network (3.5 GHz wireless and fibre network) - covers areas of Auckland, Pukekohe, Hamilton
- Cost NZD36/month (USD25)
- Service no longer avialable

SipServe

- Small internet based company
- Provide SIP call termination and origination
- Inbound +64 9 Auckland numbers available, NZD11 /month (USD 8)
- Totally independent VoIP service - can connect to SIP servers from anywhere with any device

FX Networks

- Nationwide ISP
- Building multi gigabit backbone
- Provide VoIP peering and inbound termination
- SIP based
  - Using open source SIP Express Router (SER)
  - Distributed SQL database mapping IP to phone numbers for each SER instance
  - Just like ENUM - only it's in production :)

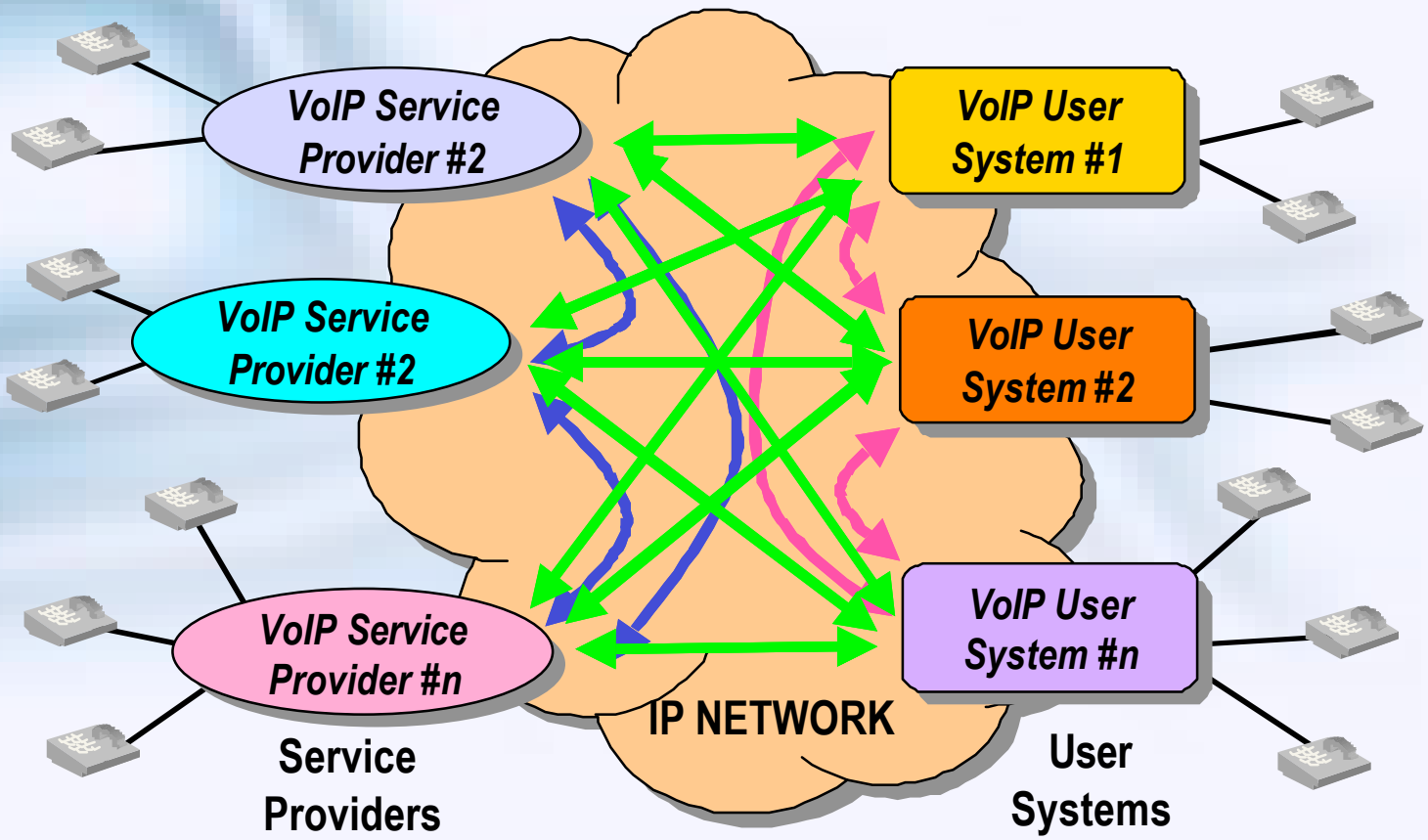
Skype

- 40,000 'users' in NZ
- Currently no NZ Skype-In
- Skype-Out calls to NZ often of dubious quality, primarily due to convoluted voice path (both IP and circuit switched) back to NZ
- Telecom New Zealand says it sees peer-to-peer telephony Skype as a "competitive threat" and is monitoring and investigating it at all levels.
- Proprietary protocol and system, so doesn't seem to be taking off in the NZ internet community

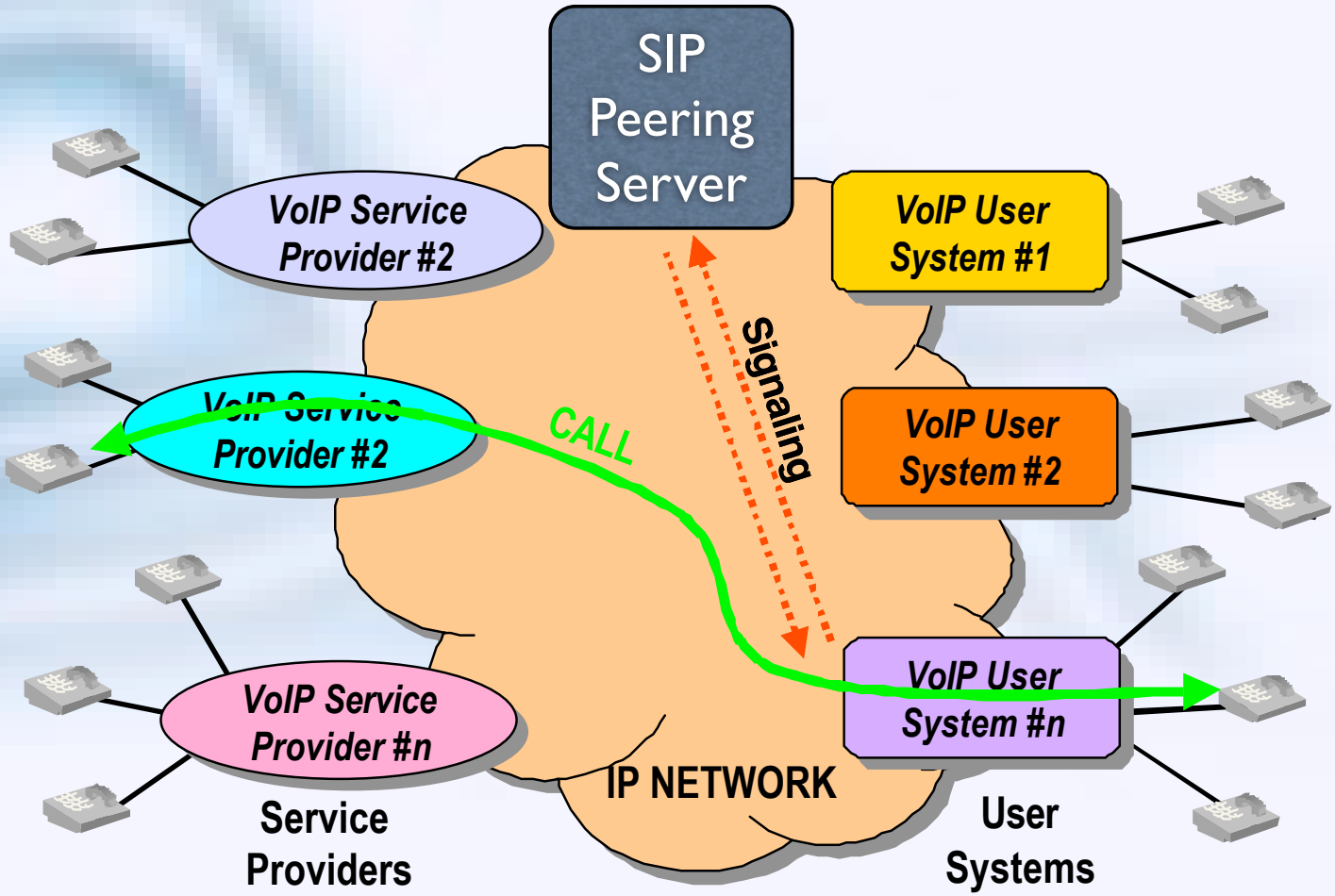
VoIP Peering

- Currently FX Networks the only company providing any form of VoIP peering
  - Positioned as a value add service for existing IP customers
- Telecom have been working on IP multimedia peering for some years, but as yet nothing is available

No VoIP Peering



With VoIP Peering



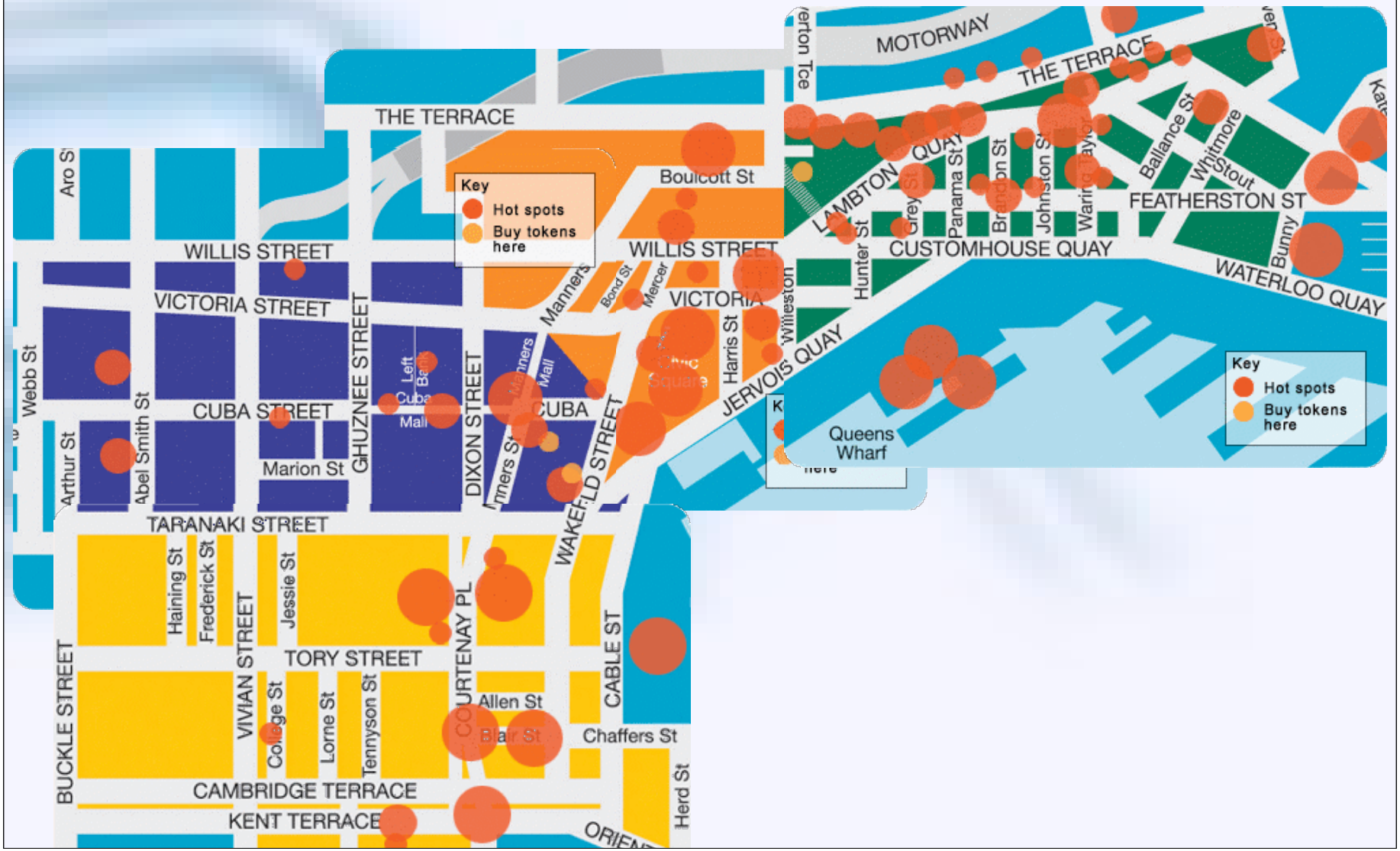
Me - a.k.a Those playing around with Asterisk

- A large number of people playing around with Asterisk in NZ
- Several companies offering offering Asterisk/VoIP consulting and turnkey Asterisk implementations
- Most interconnecting to PSTN using their home/office analogue telephone lines, some using ISDN primary and basic rate connections
- In my spare time I provide inbound termination and residential/centrex style voice services
- A growing number using Citylink's CafeNET for Voice over WiFi

Voice over WiFi

- CafeNET covers a large area of the Wellington CBD
- ~250 Hotspots, both indoor and outdoor
- Lots of overlapping coverage in pedestrian areas providing useful coverage for VoWiFi
- Network constructed of large layer2 segments allowing easy roaming between APs
- No loss of audio or calls when moving between APs with overlapping coverage

Voice over WiFi

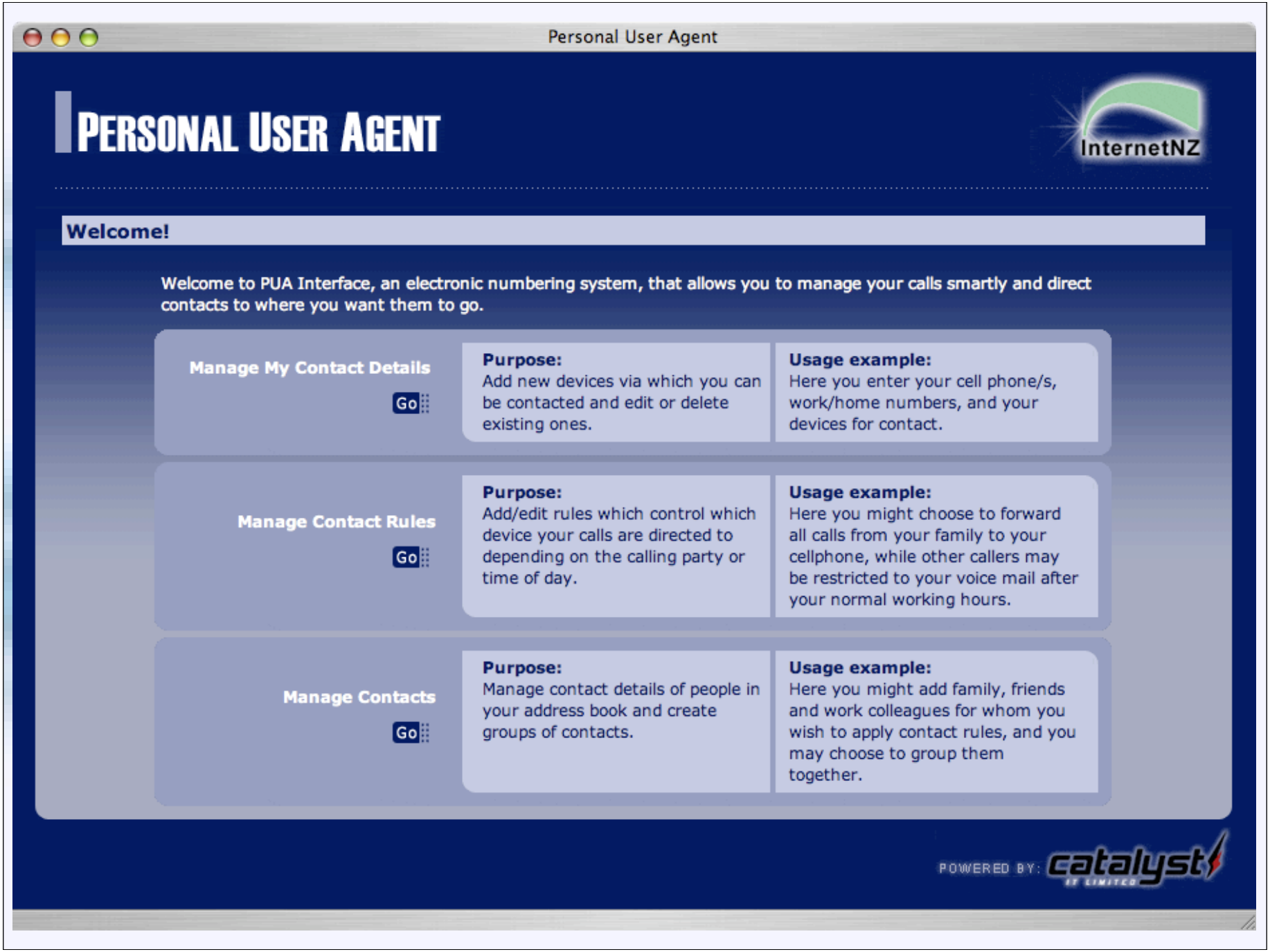


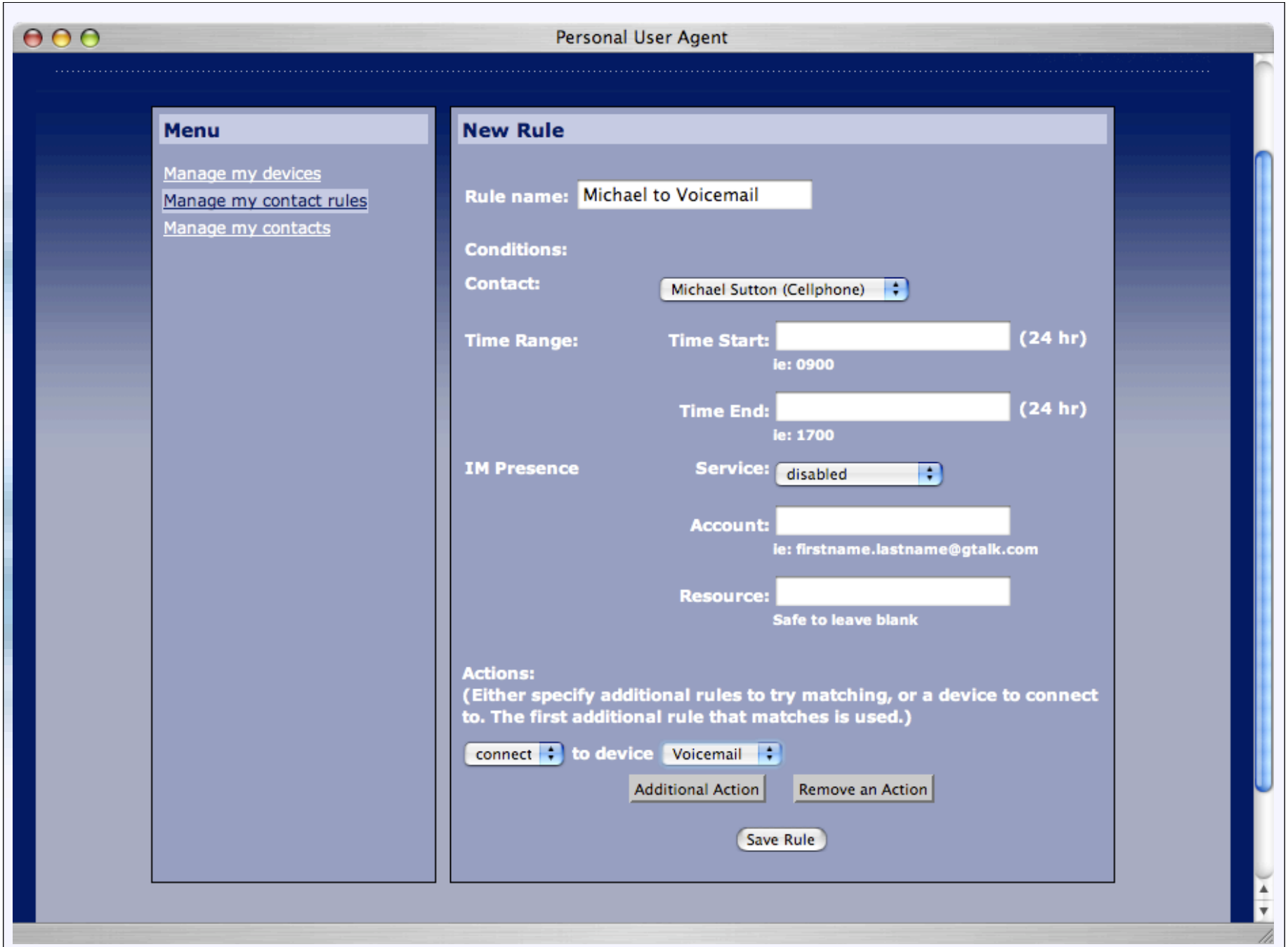
Voice over WiFi

- Asterisk used for SIP Server
- Mix of Cisco gateways and Asterisk server with digium cards
- Cellular-like coverage in many parts of Wellington CBD
- Traffic to SIP server bypasses the CafeNET captive portal mitigating the need for a logon mechanism in the phones
- CafeNET coverage expanding in Auckland, Hamilton, Hawkes Bay, Palmerston North, Masterton, Nelson and Christchurch
    - NZ poised to embrace VoWiFi

ENUM Trial

- InternetNZ currently driving an ENUM trial in NZ
- Joint taskforce between the Telecommunications Forum (TCF) and InternetNZ
- TCF want ENUM to themselves, InternetNZ want it kept ‘free’ as it is part of the internet
- TCF members are looking at a carrier ENUM solution for interconnection between carrier networks, user ENUM is a second priority task
- Smallscale Personal User Agent (PUA) trial in place


Personal User Agent
PERSONAL USER AGENT
InternetNZ
Welcome!
Welcome to PUA Interface, an electronic numbering system, that allows you to manage your calls smartly and direct contacts to where you want them to go.
Manage My Contact Details
Go
Purpose:
Add new devices via which you can be contacted and edit or delete existing ones.
Usage example:
Here you enter your cell phone/s, work/home numbers, and your devices for contact.
Manage Contact Rules
Go
Purpose:
Add/edit rules which control which device your calls are directed to depending on the calling party or time of day.
Usage example:
Here you might choose to forward all calls from your family to your cellphone, while other callers may be restricted to your voice mail after your normal working hours.
Manage Contacts
Go
Purpose:
Manage contact details of people in your address book and create groups of contacts.
Usage example:
Here you might add family, friends and work colleagues for whom you wish to apply contact rules, and you may choose to group them together.
POWERED BY: catalyst IT LIMITED


Personal User Agent
Menu
Manage my devices
Manage my contact rules
Manage my contacts
New Rule
Rule name:
Michael to Voicemail
Conditions:
Contact:
Michael Sutton (Cellphone)
Time Range:
Time Start:
(24 hr)
ie: 0900
Time End:
(24 hr)
ie: 1700
IM Presence
Service:
disabled
Account:
ie: firstname.lastname@gtalk.com
Resource:
Safe to leave blank
Actions:
(Either specify additional rules to try matching, or a device to connect to. The first additional rule that matches is used.)
connect
to device
Voicemail
Additional Action
Remove an Action
Save Rule

ENUM Trial

- Still early days
- Lack of active development on useful applications for ENUM (e.g. ActiveX plugins for browsers)
- Not a lot of buy in to the whole ENUM concept by the wider NZ technical community
- InternetNZ hoping to obtain the 4.6.e164.arpa delegation
- Suffers from the standard struggle between the Telco's and the internet way of doing things

VoIP Issues

- Emergency services (111) - no location information, and in some cases not able to be called
  - No real work being done here yet, not a large number VoIP users yet, so not currently a big issue
- Lack of significant voice peering in NZ
  - Largely due the relatively low number of VoIP users
- Telco pushback
  - By and large Telecom and TelstraClear view VoIP as just another technology and would rather others don't do anything too much with it

VoIP Issues

- Telecom have made deliberate attempts to break VoIP on their mass market internet products - both wholesale and retail!
  - All DSL internet products are 'not designed to support real time protocols'
  - Not believed that any specific VoIP busting technology in use at this stage
  - High contention ratios, limited upstream bandwidth, and a relatively noisy copper environment do enough to impair VoIP

VoIP Issues

- Quality of mass market broadband connections
  - Most users on 128kbit/s upstream
  - High contention ratios in access network - currently around 80:1, upgrading to 150:1 shortly
- Lack of any specific VoIP PSTN number range
  - Too hard for most internet-only companies to get into the game this way

Summary

- Still a remarkably small and immature VoIP market in NZ
  - A lot of tinkering happening in the VoIP PBX space, but not a lot in terms of 'real' VoIP services
  - Not as much to report as I would have liked!
  - A lot of ISPs and individuals currently looking at deploying VoIP services, spurred on by SIP and open source implementations
    - Asterisk www.asterisk.org
    - SIP Express Router www.iptel.org/ser/
    - SIPX www.sipfoundry.org/sipX/
    - and many others

Questions???