

21CN

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Introduction

- Andrews & Arnold Ltd
 - Niche technical ISP
 - Over 12 years in communications
 - Technical customer base
- Adrian Kennard
 - Background in software and telecoms
 - Worked in R&D for STC and Nokia
 - Owner and director of A&A
- FireBrick
 - Hardware and software for routers and firewalls

What we expected from 21CN

- Convergence
 - Voice, broadband, ethernet, all over common network infrastructure and interconnects.
 - Single voice/broadband line cards at exchange
 - Just as reliable as existing networks
- New technical features
 - Better broadband, e.g ADSL2+, annex M, etc.
 - Better network, e.g. priority tagging traffic
 - Quicker development of new services
- Lower costs
 - More scalable costs for us, lower overheads
 - Fewer types of interface and protocol

Our end

- One big pipe in to BT
 - Scalable bandwidth costs, low overhead
- Dual gig WES links to Telehouse
 - Was installed promptly
- Took a while for BT to be ready
 - As a trial, this was expected
- Simple BGP link on /30 IPv4 per WES
 - Made for simple fallback
- Odd arrangement for RADIUS using NAT
 - Did not handle failure at all well
 - Changes since now address this
 - BT happy to work with us to solve such problems

Using BGP

- Using BGP both ways allows a lot of flexibility and makes fallback easy
- It would allow BT to make more of their network visible for other 21CN services.
 - Sadly – not yet!
- The links also use VLANs, but this seems to be local to the way the WBMC is set up and not allowing other BT 21CN service to piggyback on the WES links, yet!

RADIUS

- Platform RADIUS to two pre-configured endpoints on our network
 - BT now allow routing using BGP for this, so fallback works
- We respond with IPv4 tunnel endpoint details
 - BT then connect to that endpoint, which we can have anywhere on our network announced to BT via BGP
- Allows simple fixed platform RADIUS to route L2TP directly to resellers (high MTU peering)
 - Circuit ID and speed in RADIUS and L2TP

FB6000 L2TP

- We have chosen to use our own FireBrick FB6000 L2TP routers to terminate the WMBC connection and handle BT BGP
- Up to gigabit traffic handling
- Very low power 1U box (around 30W)
- Multiple line bonding downlink without MLPPP, and fast fallback (10 seconds)
- Native and tunneled IPv6 handling
- Constant quality monitoring with live loss/latency/throughput graphs

The other end

- End users still split and jumper to MSAN
 - Not using combined PSTN/broadband cards
 - Fast connect as already on card, not!
 - Why not hand over behind modem to LLU?
 - Political
- ADSL2+ services
 - ADSL1/2+ control at out end
 - Stability options controlling DLM, like 20CN
 - Capped uplink option 448K
 - Elevated traffic priority in network
 - No annex M yet, but soon
 - Some equipment being an issue, lock to ADSL1

New installs

- New line installs on 21CN usually work fine
- On-line checker allows our ordering system to offer customers 21CN if their exchange supports it
- Some exchanges well ahead of schedule
- Usually new router/modem so no issues with ADSL2+
- 40% coverage March 2009
- 60% coverage March 2010 (maybe)
- 66% coverage March 2011 (maybe)

Regrading to 21CN

- Teething problems (to say the least)
 - Regrades not happening
 - Regrades delayed days
 - Engineers messing up jumpers and no service
 - Jumper to equipment not yet in service
 - Jumper to equipment in service but no backhaul to WBMC (e.g. Docklands)
 - Availability checker errors
 - Bulk process – 10 lines minimum
 - Bulk process – not working
 - Bulk process – orders before in service date
- A lot better now, finally...

Reliability

- Core network issues
 - Some sort of timeout, probably BGP, internally
 - Randomly losing Birmingham for a few minutes
 - Numerous planned upgrades to bits of network
 - Some weird routing issues at one point
 - Route cache issue in BT core router
- Again – a lot better now
 - Probably at least as good as 20CN, at last

Native IPv6 support

- Native IPv6 does not work on some 20CN
 - It truncates short native IPv6 packets
 - Known CISCO bug with a 3 year old fix
 - Not going to be fixed. BT state no IPv6 support
 - FB6000 L2TP workaround padding packets
- Native IPv6 works on 21CN, it seems
 - Customers asking for IPv6 support on 21CN
 - 20CN spec says only IPv4, 21CN does not
 - So 21CN should work with any PPP contractually
 - BT committed to support IPv6 on PPP on 21CN
 - So officially allowing native IPv6 over L2TP
 - BT committed to support IPv6 including PTA
 - Long term project

XML and stuff

- We were new to XML/SOAP, and we believe we have a better understanding of XML now than some parts of BT - shocked!
- XML ordering and fault handling was not part of the trial at all, why?!?
 - Novice mistakes delayed any XML handling, e.g. & in our company name
 - Novice mistakes like local time / UTC mixed up, and even use of 12 hour clock on XML timestamps and non standard format
 - Design omissions – e.g. getting MAC on WBMC
- Mostly working now after lots of work

The way forward

- IPStream connect
 - Putting 20CN end users on our 21CN pipe
 - Massive costs for a small ISP running both
 - Expected early 2008
 - Expected July 2008
 - Expected late 2008
 - Expected early 2009
 - Expected August 2009
 - Fingers crossed....
 - We need this to save costs
 - We need this to free up capacity

Ethernet services

- New services from BT because of 21CN
- L2 traffic from end users back to us, VLAN
- Site to site traffic between end users
 - MPLS core in 21CN
- Ethernet access to users site
 - 100M or 1G fibre (WES)
 - Committed bandwidth in steps e.g. 10M on 100M
 - EFM using multiple copper pairs
- Our end is a separate gig link and not using same links as broadband. Maybe one day!
- Exciting new service

Conclusion

- 21CN offers lots of hope for the future
 - A lot is still hope and not reality
- There are new services emerging
- Broadband on 21CN is pretty much ready now.
 - But has taken a lot longer than we or BT expected
- The future's bright for ISPs prepared to take it on and prepared to work through the issues of any new services