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Considerations in Large Scale IPv6 Construction

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CSIRO – 80 years of achievement

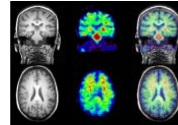


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CSIRO Research Themes led by the ICT Centre

- e-Health
- e-Technology
- Mining ICT and Automation
- ICT for Safeguarding Australia
- Sensors and Sensor Networks
- e-Research



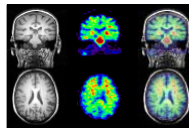
- The ICT Centre participates in all 6 current National Research Flagships.

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Recent R&D Highlights

- 6 gigabit wireless communications
- Precision location systems
- Medical image analysis
- Search engine technology
- Robotic Mining & Automation
- Trust Extension Device
- Composition of Web Services
- Sensor Network applications



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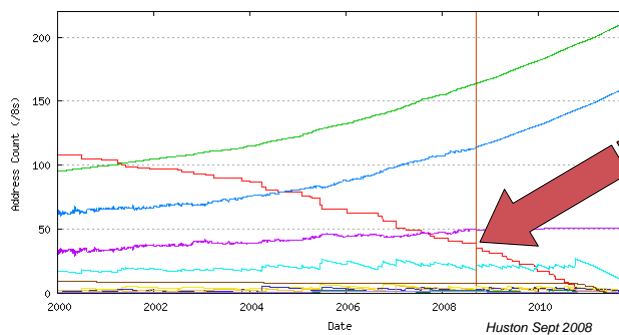
Disclaimer: this work represents the author's opinions (and some others) only – *I'm still new here!*

[Until we do some real research to substantiate it]



How soon?

"This anticipated rate of increasing address consumption will see the remaining unallocated addresses that are held by IANA reach the point of exhaustion in February 2011. The most active RIRs are anticipated to exhaust their locally managed unallocated address pools in the months following the time of IANA exhaustion." Huston Sept 2008



Practically that means 'RSN'

- The average new product development time within a typical telecommunications carrier, or large scale ISP, is of the order of 1-2 years
- That means in order to *ensure continuity of services*:
 - IPv6 is needed
 - Dec 2010 requires telco and ISP IPv6 products in order for them to remain competitive
 - Dec 2010 – 24 months = *NOW*
 - Carrier grade NAT is needed
 - Same time frames as above apply
 - Product shortfalls need to be understood: early indications are *not* good
 - Session Border Controllers will also help
 - This merely contains your depletion problem
- By the way: you can't really block it...

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Problem: nobody wants it!

- I no longer believe this to be true
- Public address depletion means you will need to act (see previous diagram)
- Internal addressing issues also exist
 - How many network 10s do you have?
 - How many MPLS domains do you have?

Consider Commcast's problem:
20m+ customers
2.5 IP addresses/set top box
= 100m IP addresses required
This is too many for network 10

- IPv6 can potentially solve all of these problems

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Problem: my network is SO BIG!

- Within Australia there are a number of big networks (90% of the market), and some smaller players
 - How many end points do they have?
 - 30 June 2008 there were 7.23 m Australian Internet subscribers (1.02m business/govt subscribers and 6.21m households) [ABS]
 - 30 June 2007 mobile users exceeded the Australian population [ACMA]
- But maybe there will be another...

The National Broadband Network needs to reach:

- 7m+ households (13m+ unique GNAFs)
- ~1.8m+ small businesses
- ~1m larger entities

le 15m+ projected total over next 6 years
But don't forget the 20m+ mobile users

This is too many for network 10



Answer: plan, phase, contain

- Try it out first
 - *This horse has now officially bolted*
- Audit systems and establish remediation plans
 - "Everywhere an IP address is stored, displayed or transmitted needs to be checked" [Durand 2006]
 - Remember Y2K? They had methodologies, funded projects, staff teams and the momentum to achieve...
- Procurement and other key business processes
 - Evaluate your procurement practices: everywhere it says "IP" make sure all flavours are included – from Activation to Workplans
- Test cycles
 - You do have these things already, yes?
- Deployment



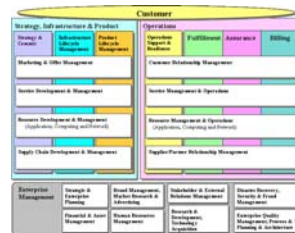
Trying it out now means...

- **Public side:**
 - Check your contracts!
 - An "Internet Service" may indeed imply a public IP address
 - Start with basic web services
 - Static web pages
 - Simple transaction services
 - Small islands of deployment
 - Check, validate and grow
- **Private side:**
 - Same as the above, depending on your needs



Audits

- **eTOM, ITIL, ITU or IETF? [Pick your favourite model]**
 - FCAPS
 - Fault management systems
 - Configuration systems
 - Accounting systems
 - Performance systems
 - Security systems
 - eTOM dimensions
 - Operations, Fulfilment, Assurance and Billing
 - Customer relationship, Service management, Resource management
- This must include every end user and service device class
- This must include people: skills, awareness, comfort



Procurement and other key business processes

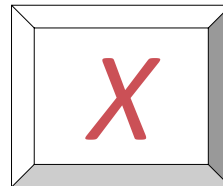
- Procurement

- The check box "IPv6 compliant" is *not* enough
- All the technical standards used in your specifications must adequately address IPv6 or you *will* fail

- Fault management

- Service activation and management

- This includes contracts for service



Test practices

- Quite simple really:

Whatever you deem necessary today for IPv4 deployment must also be satisfied for IPv6

- IOS/Junos/xxx version testing
- MIBs
- VPNs
- Physical interfaces
- Combinations of the above
- Interworking
- And don't forget the actual services...
(software, interworking, desktops)



Deployment

- In short: don't be afraid
- There is no flag day this time
- Do it, or lose your customers to someone who will

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