

ANU

Advanced Communications Deployments: IPV6

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Overview

- Bandwidth
 - Protocols
 - Services

ANU

- Networks and Communications
 - Researching and Delivering world class network facilities and services for the Australian National University

Bandwidth

- 10Gb IP core carried over a redundant fibre network
- 10Gb data centre services
 - 1Gb to the desktop standard
 - V6 available throughout the network
- Dedicated optical interconnects between datacentres and specialised users

Protocols

- IPV4
 - IPV6
 - Deploying V6 to applications

Services

- Reliable high speed data networks
 - Copper and Fibre
- Converged voice and video using H.323 and SIP
 - International SIP peering
- Campus wide Wireless
- Network Security
- Multicast based video reticulation
- Research support

IPV6

- Why ?
- When ?
- How ?

IPv4 addresses are running out

- Bush, Huston and Li using different models are projecting V4 address exhaustion mid 2010
- Who cares ?
- Can't I just use NAT ?

Can't we just use NAT ?

- No
 - End to end connectivity is needed
- For your home network and specialised applications NAT is fine
- As the R&E community we need to support next generation applications

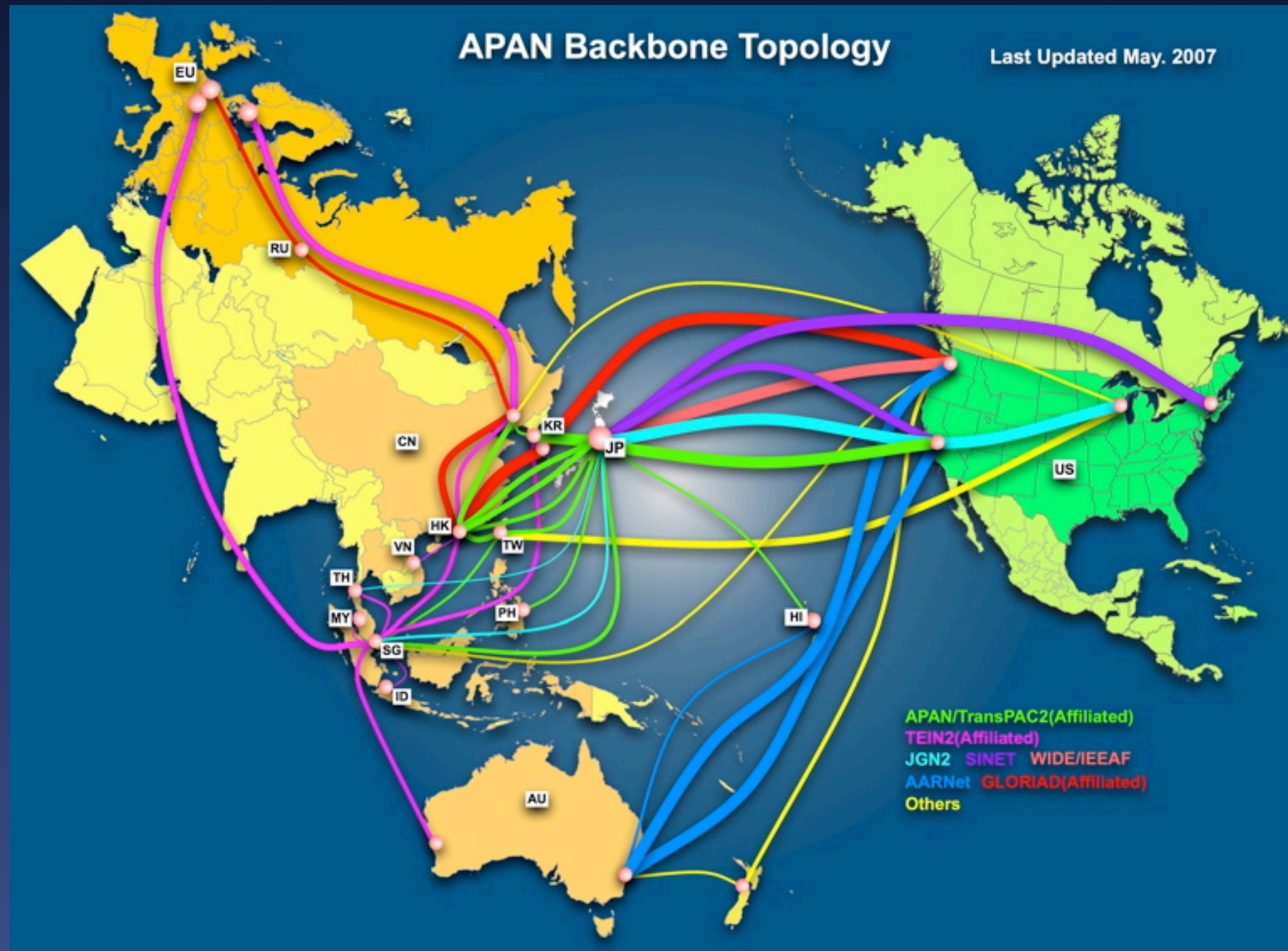
IPv6 is coming

- Why ?
 - The internet is not going away
 - Massive Asian population with growing wealth
 - Mobile devices



Asia

Research and Education Networks



When ?

- This is bigger than Y2K so you better start getting ready now
- Test and Transition
- Add V6 to your purchasing requirements and development roadmaps

How ?

- Some examples of what we've done at the ANU to implement IPV6

Initial steps

- Activate V6 routing in network core
- Peer to AARNet
- Setup V6 DNS AAAA forward and reverse records for well known services
 - DNS, www, mail

Core

- Cisco 6500 series core
- Just worked
 - Static IGP routing
 - Dynamic V6 IGP not currently supported in safe harbour train or modular IOS

IPv6 network stacks

- Native V6 support in Linux, FreeBSD, OSX and Windows Vista
- Activate on WindowsXP via cmd line
 - ipv6 enable
- Browsers now default to the V6 address first

DNS

- IPV6 addresses are an unfamiliar format and the most common config error
- Our DNS management scripts needed to be updated to add both V4 and V6 addresses for new entities and to handle V6 addresses
- All new devices get both V4 and V6

Firewalls

- Cisco FWSM blades (virtualised mode)
 - Outgoing V6 permitted
 - Testing V6 state-full inspection
 - No issues identified to date

V6 Multicast

- Currently testing
 - EtherDVB video streaming
 - DVTS
 - Native and using the CanalAvist overlay network
 - UltraGrid HD video

SIP

- Using V6 for SIP peering activities with APAN
- Transparent use of V6 for peering with V4 based edge service

Core Services

- DNS
- Apache
 - Enable V6 support
- All Unix based services worked transparently
 - X11, ssh, browser

Security

- Core servers
 - IP tables or TCP wrappers (both support V6)

Applications

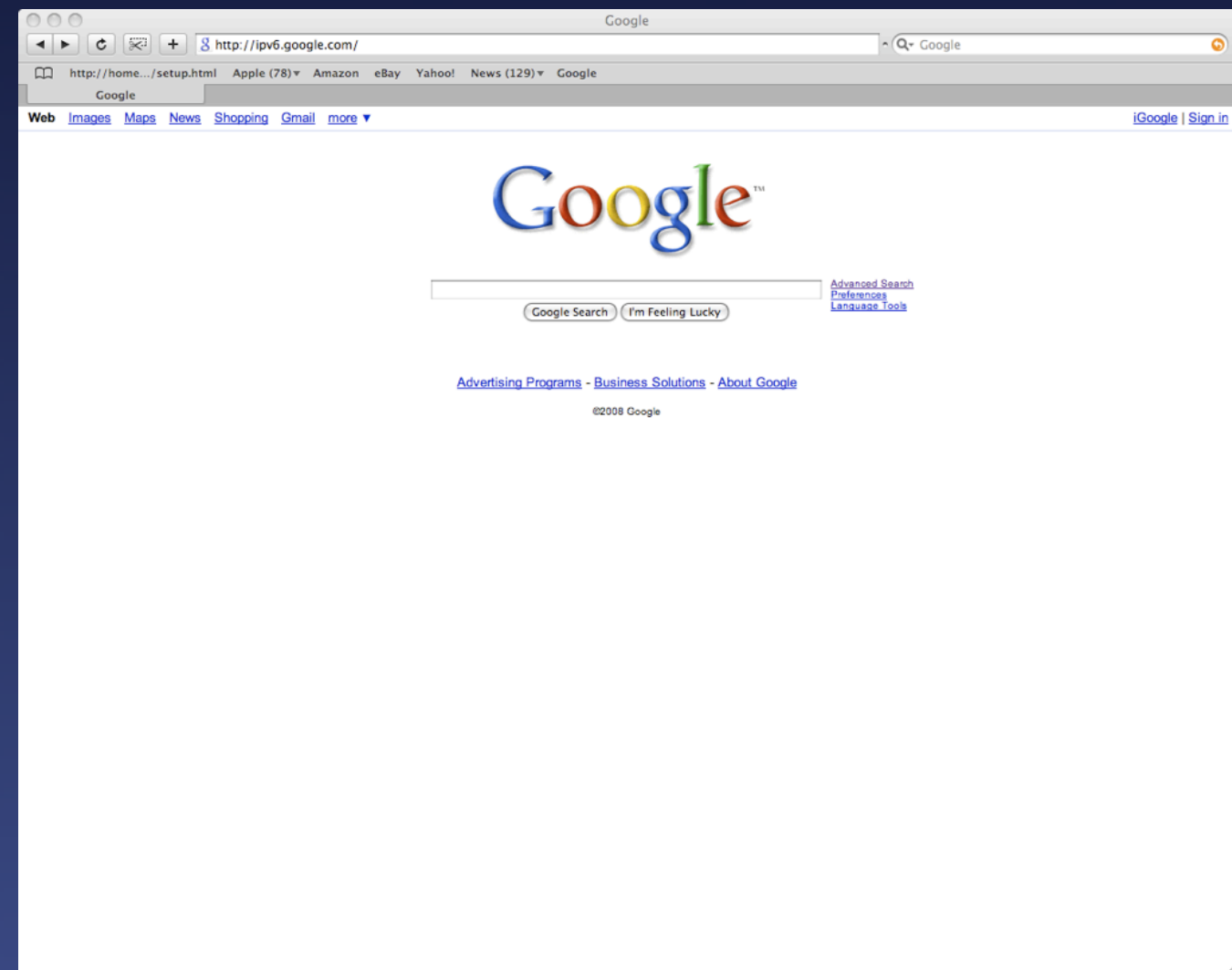
- Largest challenge
 - Should be transparent to the user
 - We expect to maintain V4 legacy support indefinitely
 - Added as a purchasing requirement
- Application development groups need to migrate to V6 without major cost impact
- Working with internal development groups to define strategy and policy

ANU is using V6 now

- Computer Science
 - cs.anu.edu.au (aka linux.anu.edu.au)
 - IPV6 is a component of the CS course
 - IPV6 Wireless mobility
- Core Services
 - NMS
 - SIP peering
 - Standard and High Definition video conferencing
 - Digital video reticulation

Using V6

- Google
- ipv6.google.com
- ANU
 - www.anu.edu.au
 - cs.anu.edu.au



Gotcha's

- Addresses
 - size
 - typos
- DNS is the best solution

Conclusion

- The time to activate IPV6 is now
- ANU is using IPV6 in production and didn't hit any major problems
- Most core services are already IPV6 capable
- Applications need to be tested against IPV6
- Still lots of interesting work to do
 - Multicast
 - Applications
 - Performance
 - Mobility

V6 Working Group

- Setup after the V6 BoF
- Glen Turner from AARNet is co-ordinating
- Please join us

Thank you