



IPv6 on JANET

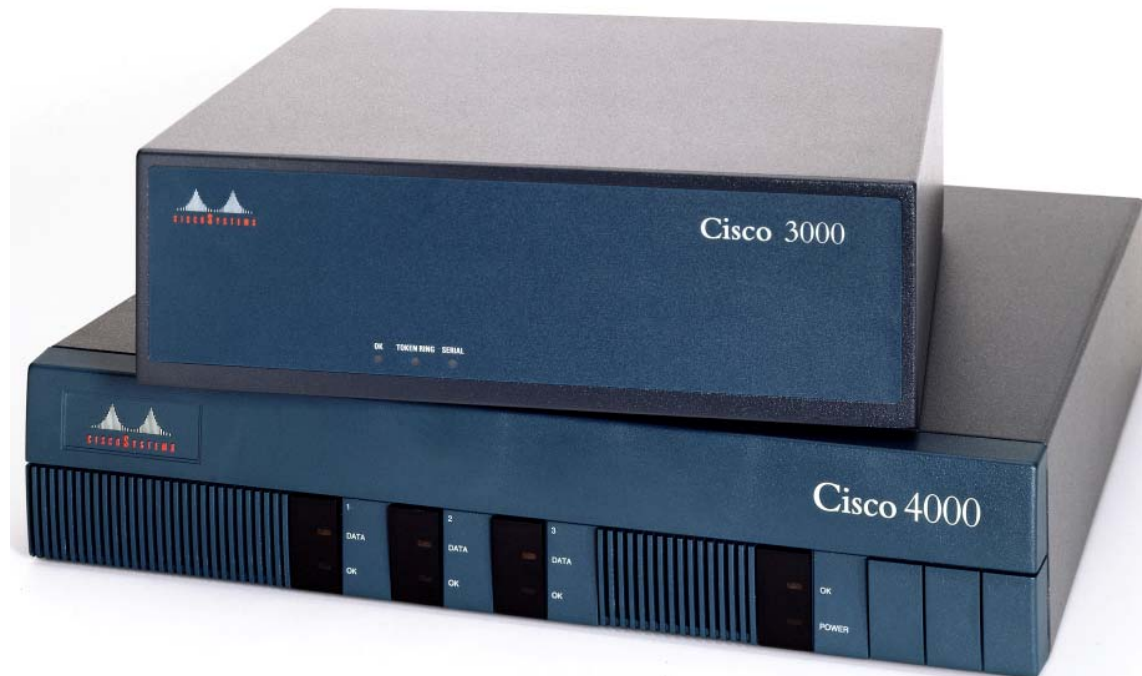
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History

- We've been running IPv6 since 1997.
 - That isn't a typo.





History

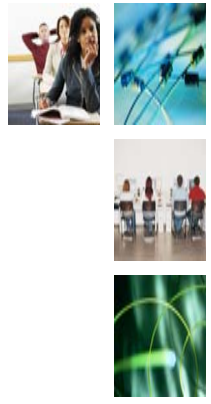
- Cisco 4500M
 - Experimental (NDA) software.
- Native link to Pipex
 - First native inter-provider link in the UK?
- Tunnels to Cambridge, Manchester, Southampton, Lancaster on JANET.
- External tunnels to Cisco, SURFnet, ISI, Sprint, imag.fr, HEAnet.

History (1997 – 2002)



- More of the same
 - Changed routers.
 - More tunnels.

History (2002)

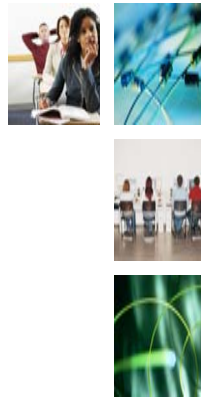


- External peerings
 - UK6X
 - LINX
- Much more community interest.
 - First of my IPv6 talks at Networkshop
 - 15 universities were connected to the trial.



History (2002)

- Reduce number of long tunnels.
- Migrate SuperJANET 4 backbone from OSPF to IS-IS.
 - Happened for other reasons, but eased the IPv6 transition.



History (2002)

- 6NET
 - Three year European project
 - UKERNA, Southampton, Lancaster, UCL
 - Applications, Middleware, Migration, Network Management...
 - ...and a network
 - Native IPv6 network between several European Research & Education Networks.
 - Lots of information still available
 - <http://www.6net.org/>

History (2003)



- Convert backbone to dual-stack.
 - IPv4 routing loop during first attempt.
 - Back to the drawing board, less aggressive rollout schedule.
 - Across most of the backbone during the year.



History (2004)

- AAAA records for ns0.ja.net added
 - More on services later.
- Native peering with HEAnet
- First native regional network connection
 - LeNSE.

History (2005)

- Native transit from NTT
- IPv6 enabled on the rest of the DNS servers.





Now

- IPv6 was mandatory for SJ5 routers.
- Native across all the backbone.
- Native transit from Tata (VSNL)
 - Telia soon.
- Native with GÉANT.
- Native with LINX peers.
- Still have some internal tunnels.
- Very few (1) external tunnels.
 - ...and even that one isn't really used.



Services – DNS

- Supported in BIND since 4.9.4
 - Although hopefully nobody is still running BIND 4!
- ns0-4.ja.net all reachable over IPv6
- ns4.nic.uk (.uk)
 - Operated by Nominet, connectivity provided by JANET.
- Primary nameserver service
 - ns10.ja.net



Services – NTP

- Supported since NTPv4.
- ntp0-4.ja.net all reachable over IPv6



Other services

- IPv6 deployment programme, regular teleconferences.
- Monitor IPv6 readiness of all JANET services.
- If not feasible to deploy on current service, look at it during next procurement cycle.

How to use IPv6

- Get IPv6 addresses
- Get IPv6 connectivity





Get IPv6 addresses

- Send email to ipaddress@ja.net
 - Follow the same procedure for IPv4
 - You can still get IPv4 addresses.
 - Sites will be allocated a /48 out of JANET's block (2001:630::/32).
 - 65,536 LANs (each is a /64).
 - More if you need it
 - Requires justification, then approval from RIPE NCC
 - Just received a request for a /40



Get IPv6 addresses

- Develop a campus addressing plan
 - This afternoon's presentations will cover this.





Get IPv6 connectivity

- Many regional networks offer native IPv6 connectivity.
 - Speak to your regional network helpdesk.
 - Those that don't, should be, *real soon now*.
 - It is in the JPA and the SLA.
- Same interface as IPv4.
 - Static routes.
 - BGP session between IPv6 addresses on interface.
- Remember your packet filters!



Get IPv6 connectivity

- As a last (interim) resort, the NOC can offer a tunnel.
 - Contact the JANET Service Desk.



IPv6 Multicast

- We know how much you like multicast, and we know how much you like IPv6.
- Simpler than IPv4 multicast?
 - When it works
 - No MSDP.
- Static RPs for “legacy” IPv6 multicast groups.
- Embedded RP preferred.
 - RP address contained in group address.



IPv6 Multicast

- Support on some platforms can be sketchy.
- Multicast beacons useful for spotting problems
 - Just like IPv4!
 - JANET IPv6 multicast beacon isn't there yet.