Using IPv6 At The RIPE NCC

Real world experience in a practical environment using off-the-shelf network equipment.

Who Am I?

- Mark Guz, Senior Engineer, Operations Department, RIPE NCC.

April 2005: What We Had

- Two separate infrastructures:
  - IPv4 using Cisco 7206vxr routers at each point of our triangle
  - IPv6 using a separate Cisco 3206
  - Manual assignment of IPv6 addresses with static routing, no router advertisements

October 2006: A New Network

- Replaced our routers with Juniper M7is
- Replaced our layer2 switching fabric with Foundry switches
- Installed Juniper/Netscreen ISG2000 Firewall HA Cluster

What Happened?

- IPv4 support was as expected: Robust and reliable
- IPv6 support was excellent on the M7is
- IPv6 on the firewalls started out well but it was not long before we started to see problems

So The Firewalls Were A Problem?

- Juniper announced full dual stack IPv6 support in ScreenOS v5.4.0
- This did not guarantee reliability but only that tickets based on problems with IPv6 would be accepted

What Were The Problems?

- Only one real problem: the IPv6 stack locked up periodically
- The firewalls stopped passing any IPv6 traffic and would not resume doing so until a reboot was effected

So What Did We Do?

- Initially we believed the problem to be related to Router advertisements and we tried to use the firewall as an IPv6 router
- We changed our set up to have static routes and manually assigned v6 addresses on the firewall

  ….for a few months it seemed to work until…
- BOOM! It stopped working again

....And How Did We Fix It?

- We decided it was a problem or bug in the firewall itself and logged a ticket with Juniper
- We worked with Juniper for a month, allowing them restricted access to our firewalls so they could gather data and check settings
- Juniper came up with a patched version of ScreenOS5.4 and we uploaded it
- As of today we have had no further IPv6 problems

Other Issues

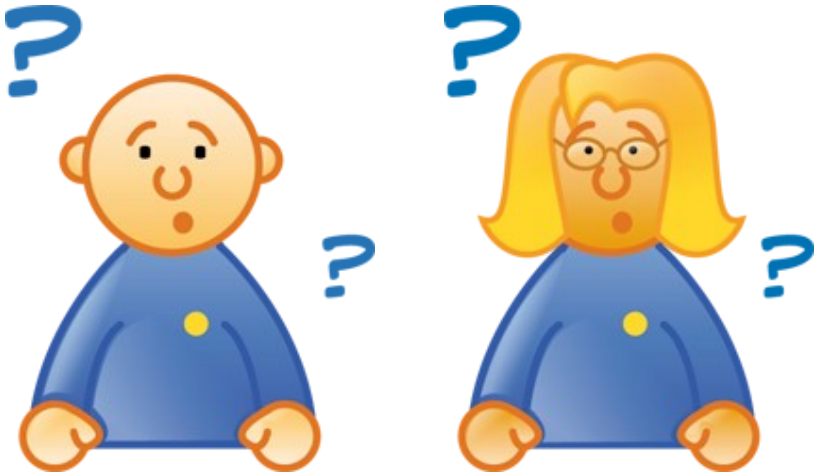
- RIPE NCC is moving towards using Hardware Load Balancers
- We prefer to use a solution from one of the major manufacturers, such as F5, Cisco or Foundry
- To our knowledge none of the major vendors support dual stack v4/v6 support for application switching in their low end fixed configuration devices. Higher end devices in some cases are supported.
- They do support v6->v4 proxying
- Foundry has intimated a dual stack Ironware release at some point in 2008

Current RIPE NCC IPv6 Services

- www.ripe.net
- whois.ripe.net
- DNS
- IPv6 incorporated into DNSMON and HostCount
- Coming Soon: MXs will support IPv6 in Q1 2008

Conclusions

- Support for IPv6 in current off-the-shelf equipment is good at the routing layer
- Support for IPv6 is still weak at the layer 4+ level but is steadily growing
- Much work still needs to be done before the industry is ready to embrace IPv6 fully



Questions?