IPv6-only Data Centres

Or, 'Can't we turn off IPv4 yet?'

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About Bytemark

- In the hosting market from 2003
- Received our IPv6 allocation in 2004
- IPv6 comes as standard on (almost) all services
- Opened our first data centre, 'YO26', in 2013
- Technical staff, well versed in use of IPv6*

*Including **at home**, courtesy of aa.net.uk

Why IPv6 only?

- Wasting valuable IPv4 on infrastructure
- If it's “IPv6 ready”, it should just work right?
- Scale: who likes renumbering PDUs?
- Peer pressure: Facebook did it!
- Why not? *We* should be able to

So it's simple. We just kill the IPv4...

… unfortunately, we found some problems.

Data Centre Components

- Serial concentrators
- Rack Power Distribution
- Ethernet Switches
- Hosts: IPMI/PXE
- Network storage

Serial Concentrators

- Opengear CM4148, quite reliable
- Supports v6 well: HTTPS/SSH work fine
- Take away IPv4 and it'll crash after 2-3 days
- No IPv6 DNS option
- No IPv6 syslog

Switches

- Extreme XOS works well. SSH, TFTP, SNMP, NTP & DNS work just fine.
- Cisco Catalyst seem to 'just work' from 15.0 (12.2 is the complete opposite, however)
- XOS HTML API doesn't listen on HTTPS for IPv6

PDUs

- Use SNMP for port toggling, this works over v6
- Varied hardware/software versions meant

support hasn't been ubiquitous

- No options listed for IPv6 DNS/NTP
- We're stuck with RFC1918 “temporarily”

LOM/IPMI

- Utilising Supermicro 'micro cloud' chassis
- No serial ports, so had to use IPMI instead
- DHCPv6 is on by default (not autoconf)
- No way to hard-code the IPv6 address via

IPMI itself

Though we've worked at a few things, and they're serving us rather well...

PXE/Netbooting

- UEFI can support v6 PXE, but our hardware still comes with BIOS
- Re-flashing to iPXE not always possible/sane
- Solved by using local-only IPv4 & chain-loading a small, IPv6-capable image
- Internal bigv as the guinea pig: no IPv4 routing at all

Network Storage

- bigv.io uses flexnbd for block-level IP storage
- IPv6 is well supported (we wrote it[1])
- Exporting a **lot** of disks has been made a non-event with a single IPv6 address per device
- Pushing 10Gbit boundaries during migrations

[1] https://projects.bytemark.co.uk/projects/flexnbd-c

Conclusion

- Vendors aren't testing this, and they should be
- Just adding an address/gateway isn't enough
- Time is against us: we've been forced to find workarounds for half-hearted implementations
- Eager to experiment/innovate where we can
- It's not all doom and gloom

Thank you for listening

Any questions?