

draft-chown-v6ops-campus-transition-00

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Rationale

- Much work done on enterprise scenarios draft
 - Very complex - huge range of enterprise types
- Now at WGLC on v6ops-ent-scenarios-05
- General analysis of scenarios beginning
- We thought it would be useful to
 - Look at a specific example (university campus)
 - See how helpful v6ops-ent-scenarios-05 is for this case
 - Perform both transition analysis and gap analysis

Scope

- Large campus department (at University of Southampton, UK)
- 1,500+ users with 1,000+ systems
- Wish to deploy IPv6 alongside IPv4, for teaching, research, outreach, to foster new application development, and to be ready for IPv6-only devices.
- (Actually have deployed a lot of IPv6 already, some analysis in this draft is done retrospectively)

Which ent-scenario?

- Our campus study falls under "Scenario 1" of the IPv6 Enterprise Network Scenarios document, i.e. the campus network is “an existing IPv4 network, where IPv6 is to be deployed in conjunction with the IPv4 network”.
- Scenarios 2 and 3 do not apply. Scenario 3 (IPv6 dominant) may apply in due course, e.g. to WLAN

Applying ent-scenarios-05

- Network infrastructure components
 - Component 1: Enterprise Provider Requirements
 - Component 2: Enterprise Application Requirements
 - Component 3: Enterprise IT Department Requirements
 - Component 4: Enterprise Network Management System
 - Component 5: Enterprise Network Interoperation and Coexistence
- Discussion of Network Infrastructure Component Requirements

Enterprise Provider notes

- 12 IPv4 Class C's, allocated from pre-CIDR Class B allocated to university
- JANET provides IPv6 /48 to university
- University offers a /52 to department
- IPv6 brought in via native & 6PE combo
- No multihoming used for IPv4 or IPv6
 - Does simplify the scenario
- Separate firewall entry for IPv4 and IPv6

Enterprise Application notes

- Application inventory listed in draft
 - Mixture of open source and commercial
- General goal to be IP-agnostic
 - v6ops has application aspects draft
- Transition key services first, e.g. DNS
- No NAT used internally
 - Does simplify the scenario

Enterprise IT Dept notes

- In-house support used
- Remote VPNs used
- No inter-site networking
- No network mobility required
- DHCP for clients, manual IPs for servers
- Static routing or RIP used internally
- No (or very little) QoS used (ample bandwidth)
- Impacted h/w and s/w are detailed in draft

Enterprise Network Management

- Not using performance management
- Using management and monitoring tools
 - Need to monitor both protocols
- Need to manage IDS and firewalls
- May need to manage transition tools
- New IPv6 issues need consideration technically and for policy
 - e.g. RFC3041 addresses

Enterprise network coexistence

- Required platforms are detailed in draft
- Single ingress/egress is Gig-E
- Required mechanisms discussed in analysis
 - Includes use of VLAN-based method
- Transition starts on the wire
 - Followed by services and applications
- Preferred legacy interaction via dual-stack
- No non-upgradeable systems identified
 - e.g. financial systems presented as web services

Discussion of requirements

- DNS
- Routing
- Host configuration
- Security
- Applications
- Network management
- Address planning
- Multicast
- Multihoming

Missing ent-scenarios topics?

- Very few :)
- Those missing include:
 - Access control (e.g. for WLAN admission)
 - Hard-coded IP(v4) addresses
 - Network backups
 - Catchall is “upgradeable h/w and s/w”
 - e.g. remote access (dialup server)
- Overall, ent-scenarios-05 has very good coverage
 - May be useful to add AAA/access control/PKI

Missing components?

- No IPv6 functions for L2/L3 switch-router hardware
- NFS/Samba
- MS Exchange
- AccessGrid
- Apache 2 module variations to Apache 1
- Active Directory
- dnews (Usenet)
- OS's: Win95/98/2000, Irix, various PDAs
- *Reverse DNS lookup*
- MLDv1/v2 snooping
- X11
- WLAN access control

Analysis

- Use parallel internal IPv6 routing (BSD) in absence of vendor switch-router IPv6 support
 - Uses draft-chown-v6ops-vlan-usage-01
 - Enables IPv6 on the wire pervasively
 - Have native IPv6 service; if not would not use 6to4
- Some transition services for external users
 - 6to4 relay, tunnel broker, manual tunnels
- Complexity is not in enabling IPv6 on the wire, it is in the services and applications
 - Often in the hands of vendors (Alcatel, SGI, MS, ...)

Summary

- We found ent-scenarios-05 very useful
- Very few standards gaps, mainly vendors
- Deploying IPv6 on the wire wasn't too tricky
- Still much to do, including:
 - Document analysis of specific scenario
 - More detail on DNS, smtp, etc issues
 - Categorise missing components, hard-coded addresses
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Where next?

- Will flesh out the document in the 01 version
 - Plan to release next version end of August
 - Full text by IETF 61
- Is it useful?
 - If not, what could be done to make it so?
 - Should specific apps/vendors be mentioned (!?)
 - Should it be a living document, if so until when?
- Is it a potential WG item?
 - If so, how should it be enhanced/progressed?