



IPv6 Deployment “Missing Pieces”

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Areas to consider....

- Standards (IETF)
- Vendor implementations (OS, router, device..)
- ISP support (deployment, service)
- Application support (porting, novel apps)
- Network infrastructure, robustness, routing
- Network management
- Application and IPv6-specific issues
- Security issues (two protocols to secure)

Network infrastructure

- IPv6 routing stability
 - Very few problems with intra-domain routing
 - However Layer2/3 VLAN products lack IPv6 now
 - Concern is intra domain (AS) routing, due to the way the 6bone has evolved
 - Need reliability for day-to-day IPv6 use
 - Many production (international) dual-stack links being deployed, at least in academic networks
- Application preference for IPv6 ahead of IPv4
- IPv6 multihoming – somewhat stalled

DNS

- Hardened on AAAA records, not A6
- No IPv6 transport to root DNS servers
- No way to discover IPv6 DNS servers in stateless autoconfiguration process
- Can't register a domain with IPv6 DNS record
- Few OS's offer IPv6 transport DNS lookups
- Ip6.int to ip6.arpa transition has been slow

Network management

- Very few instances of IPv6 transport for SNMP
 - 6NET has IPv6-only backbone, but dual-stack access to the routers for management
- IPv6 MIB work progressing slowly (not sexy!)
- MIBs being developed for both protocols
- Many devices only manageable over IPv4
 - Printers
 - Wireless access points

Service discovery....

- A plethora of methods...
 - IPv4 or IPv6 anycast
 - Link or site scope IPv6 Multicast
 - Well-known site-local addresses
 - Service Location Protocol (SLP)
 - Well-known DNS name (assumes DNS present!)
 - Piggy-backing information in Router Advertisement messages
 - DHCP
 - Link-local Multicast Name Resolution (mDNS)

Other “management” issues

- IPv6 NTP
 - Recently available
- IPv6 Prefix delegation
 - Important for ISPs
 - High priority to finalise (as a DHCPv6 option)
- IPv6 Multicast
 - PIM-SM implemented
 - No inter-domain protocol (no IPv6 MSDP)
 - Requirement for MLD snooping

Application issues

- Porting the missing applications
- Porting best practice
 - IP version independent code
- IPv6 site local address usage
 - A very hot topic!
- Implications of RFC3041 (privacy extensions)
- Use of IPv6 Flow Label
 - Currently deliberately left “open” for the future

Security

- Implementation and use of IPsec
 - IPsec support “mandated” in a full implementation of RFC2460, but usage not mandated
- Requirement for secure autoconfiguration
- IPv6 Firewalls
 - Checkpoint has functionality in new beta code
 - Requires rethink of policy for use of end-to-end IPsec between hosts
- Security of transition mechanisms



See...

- 6NET Deliverable D2.5.1
- <http://www.6net.org/publications/>